

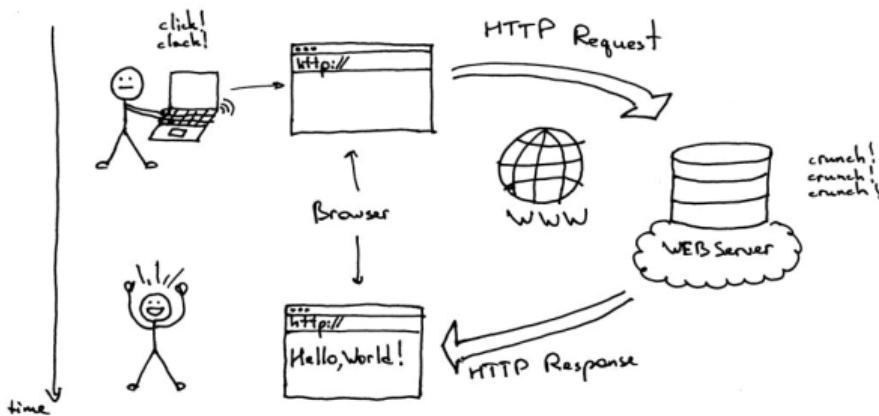
Cuteserver

Rahel Kempf, Ephraim Siegfried

Operating Systems, University of Basel

14.06.2024

Problem Statement

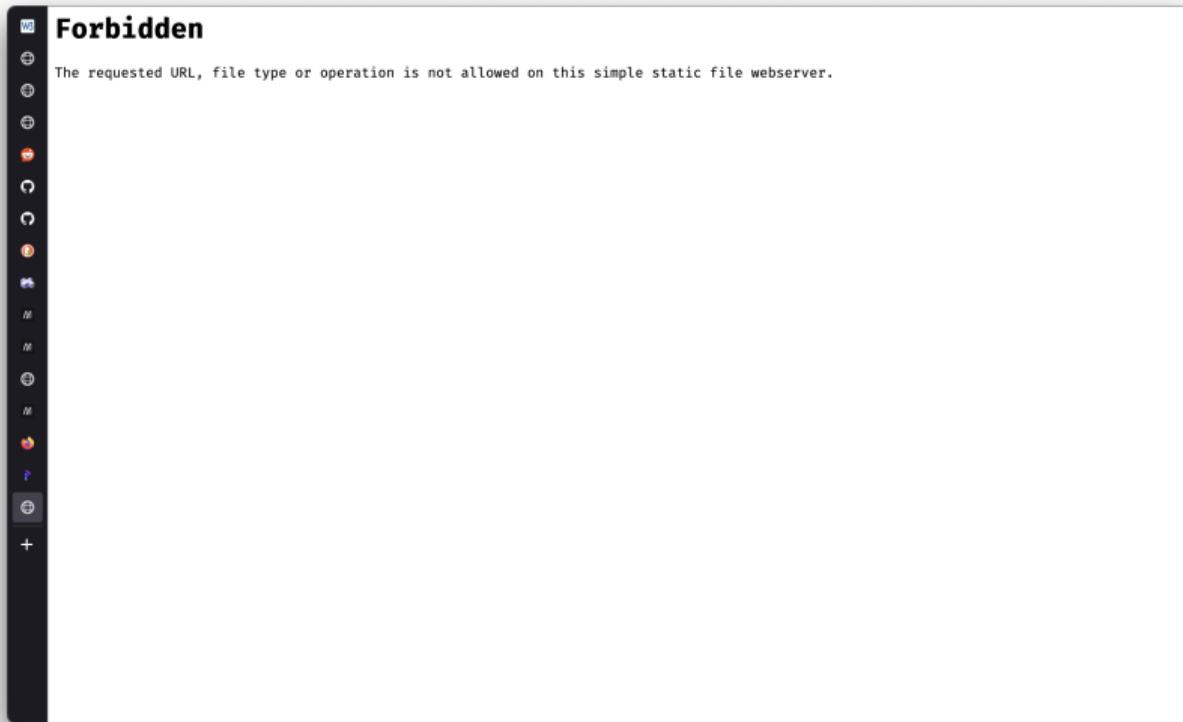


We visit web pages all the time and want to understand the underlying processes. Therefore we want to build our own web server.

Features

- > Multiple Users can connect concurrently
- > Error handling

Progress Pictures





← → ⌂

localhost:8888/hallooodummm

Import bookmarks... server nvim GitHub Programmierprojekt



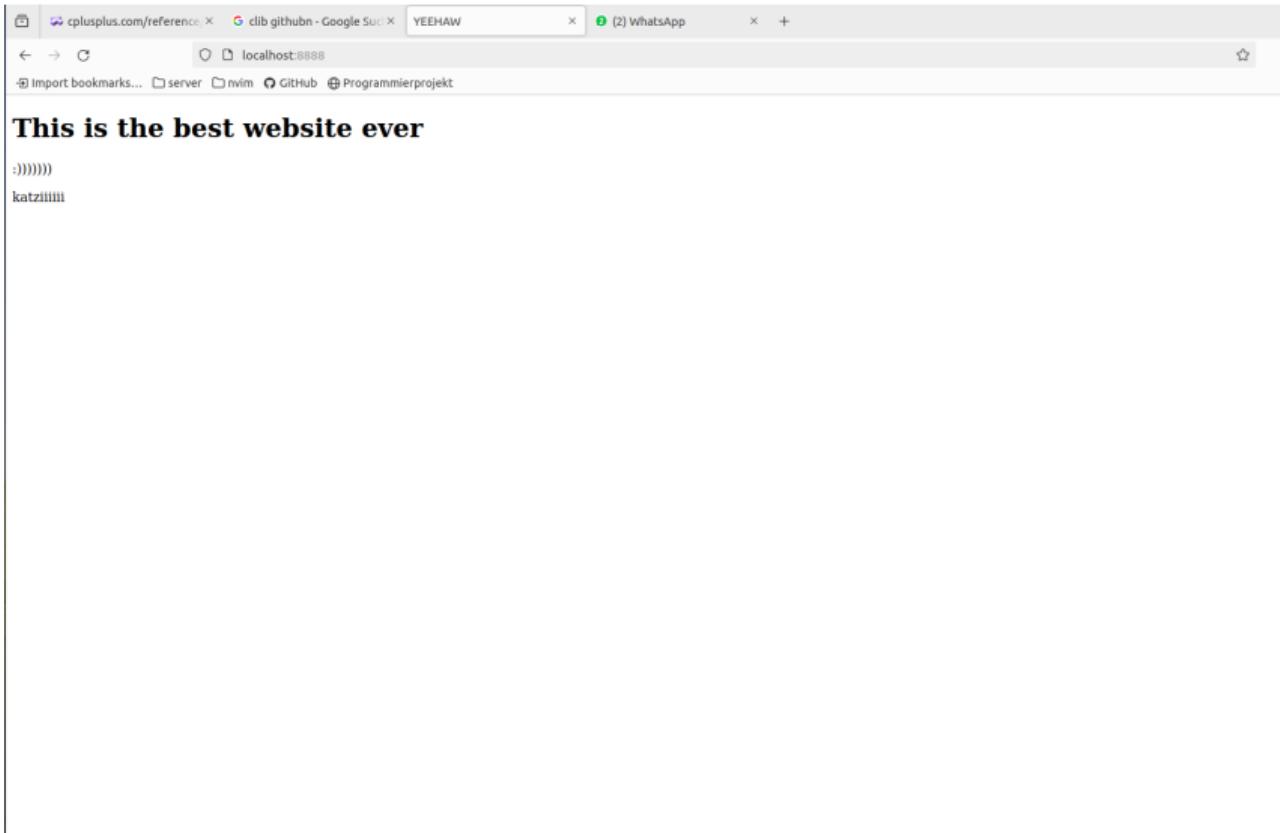
404

Not Found

Features

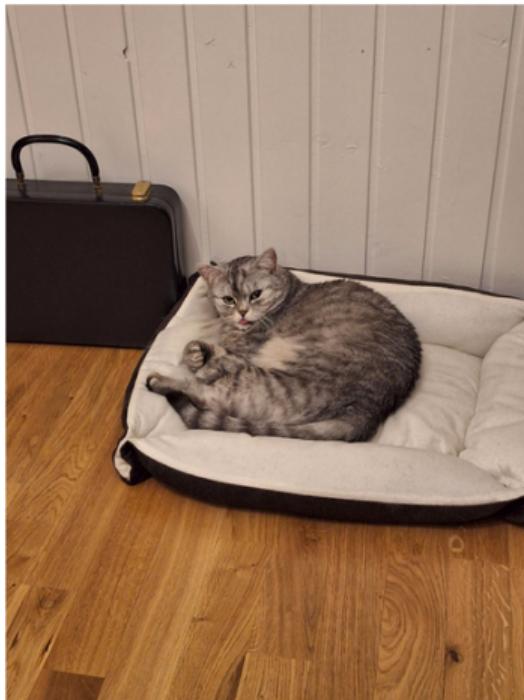
- > Multiple Users can connect concurrently
- > Error handling
- > Process HTTP Requests (GET, POST, HEAD)

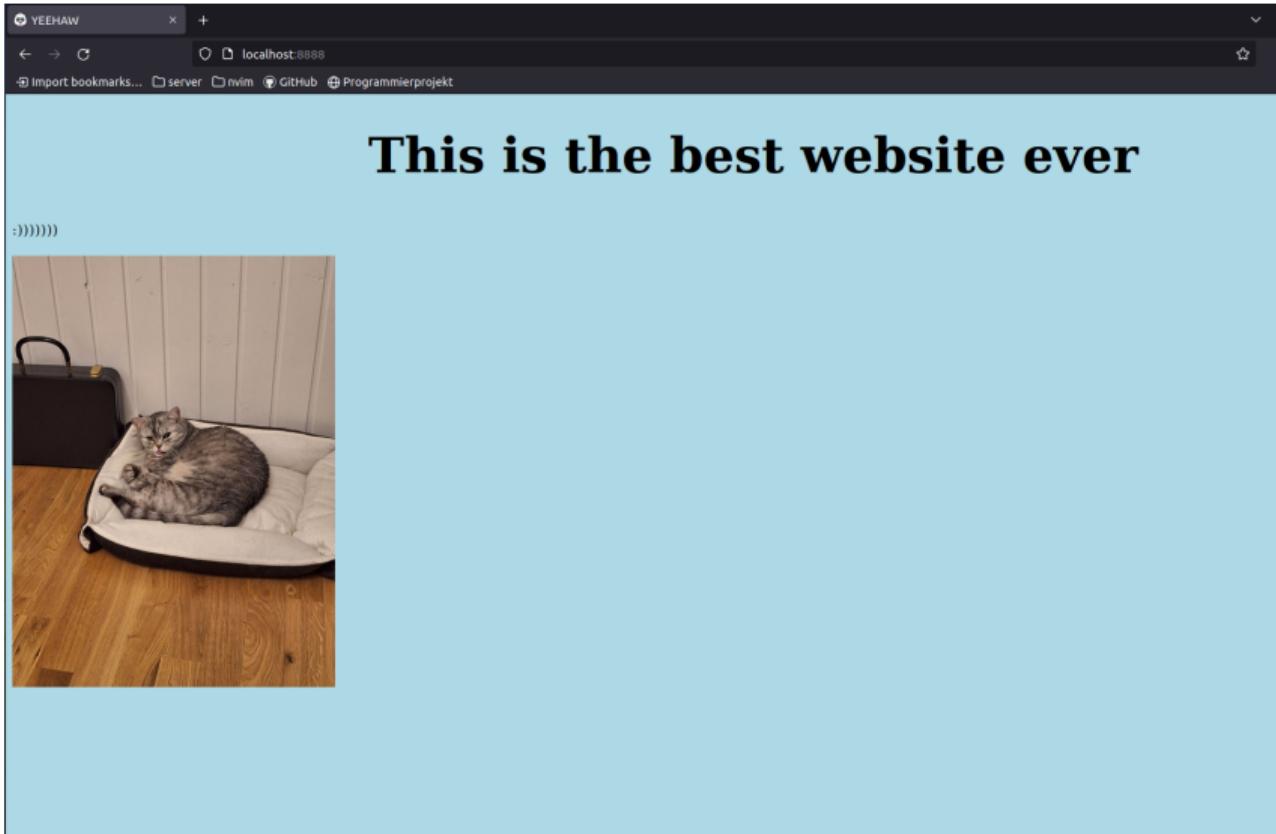
```
cyberpumucki@pumuckllaptop:~/Documents/code/WebServer$ sudo ./cuteserver 1999
19:56:17 INFO  src/main.c:99: Server listening on 127.0.0.1:1999
19:56:21 DEBUG src/main.c:16: Created sock: 4
19:56:21 INFO  src/main.c:121: New connection accepted from 127.0.0.1:40928
19:56:21 DEBUG src/main.c:28: TID: 41716 sock: 4
19:56:21 DEBUG src/main.c:29:
19:56:21 INFO  src/parser.c:33: GET / HTTP/1.1
19:56:21 DEBUG src/main.c:56: Client sent: keep-alive
19:56:21 INFO  src/response.c:59: Sending /index.html over socket: 4
19:56:22 DEBUG src/main.c:16: Created sock: 5
19:56:22 INFO  src/main.c:121: New connection accepted from 127.0.0.1:50792
19:56:22 DEBUG src/main.c:28: TID: 41717 sock: 5
19:56:22 DEBUG src/main.c:29:
19:56:22 INFO  src/parser.c:33: GET /script.js HTTP/1.1
19:56:22 DEBUG src/main.c:56: Client sent: keep-alive
19:56:22 INFO  src/response.c:59: Sending /script.js over socket: 5
19:56:22 DEBUG src/main.c:28: TID: 41716 sock: 4
19:56:22 DEBUG src/main.c:29:
19:56:22 INFO  src/parser.c:33: GET /style.css HTTP/1.1
19:56:22 DEBUG src/main.c:56: Client sent: keep-alive
19:56:22 INFO  src/response.c:59: Sending /style.css over socket: 4
19:56:23 DEBUG src/main.c:28: TID: 41717 sock: 5
19:56:23 DEBUG src/main.c:29:
19:56:23 INFO  src/parser.c:33: GET /chaetzli.jpg HTTP/1.1
19:56:23 DEBUG src/main.c:56: Client sent: keep-alive
19:56:23 INFO  src/response.c:59: Sending /chaetzli.jpg over socket: 5
19:56:23 DEBUG src/main.c:28: TID: 41716 sock: 4
19:56:23 DEBUG src/main.c:29:
19:56:24 DEBUG src/main.c:28: TID: 41717 sock: 5
19:56:24 DEBUG src/main.c:29:
19:56:24 INFO  src/parser.c:33: GET /favicon.ico HTTP/1.1
19:56:24 DEBUG src/main.c:56: Client sent: keep-alive
```



This is the best website ever

:))))))

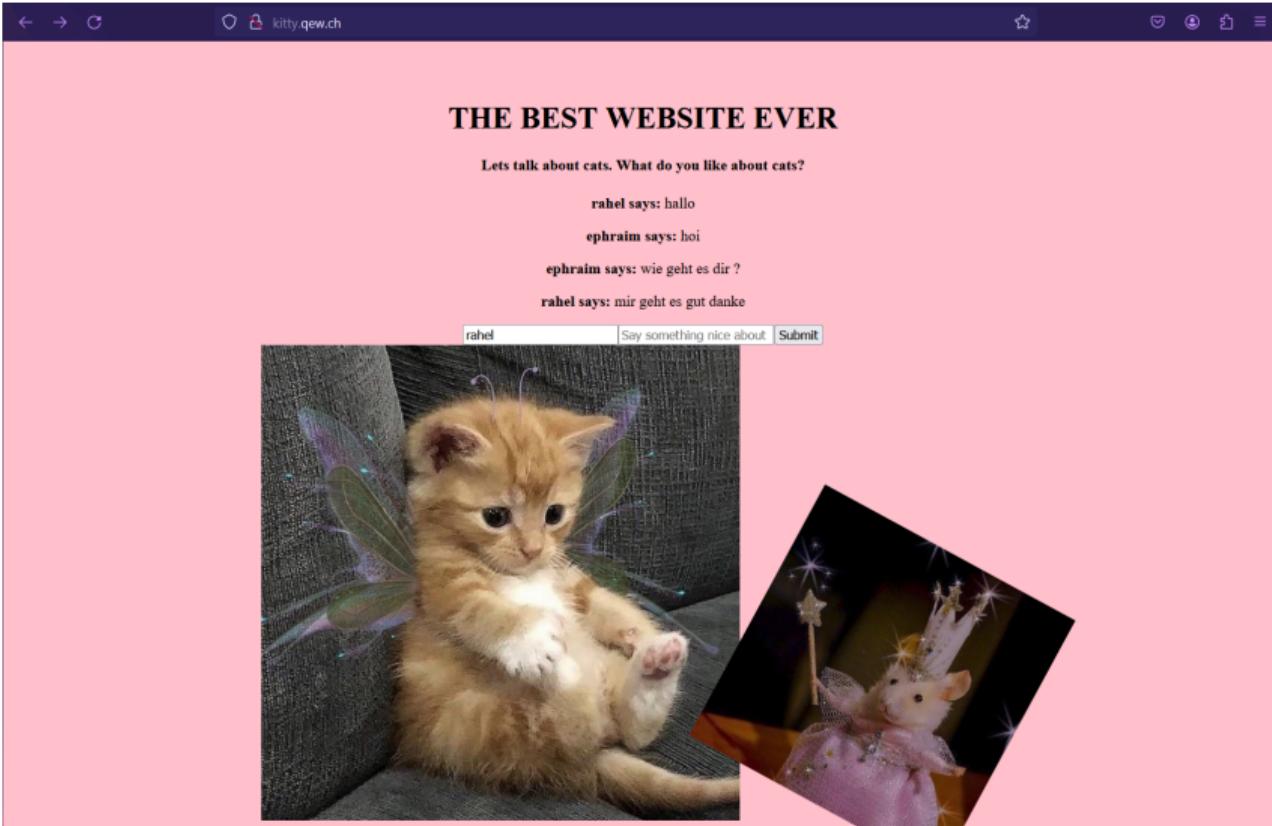




Features

- > Multiple Users can connect concurrently
- > Error handling
- > Process HTTP Requests (GET, POST, HEAD)
- > CGI (Common Gateway Interface) Support

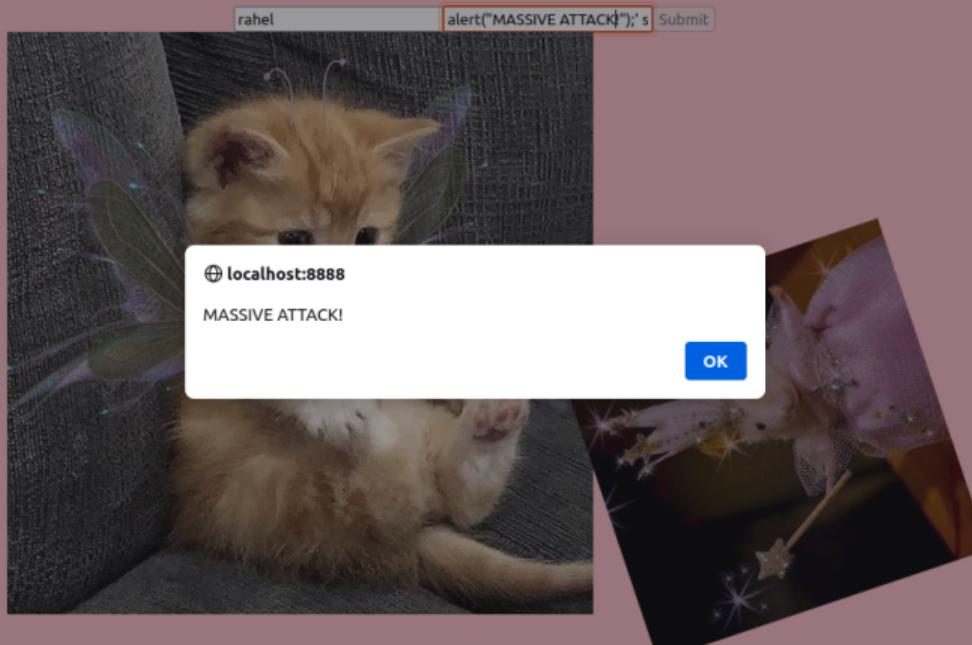




THE BEST WEBSITE EVER

Lets talk about cats. What do you like about cats?

rahel says: hallo



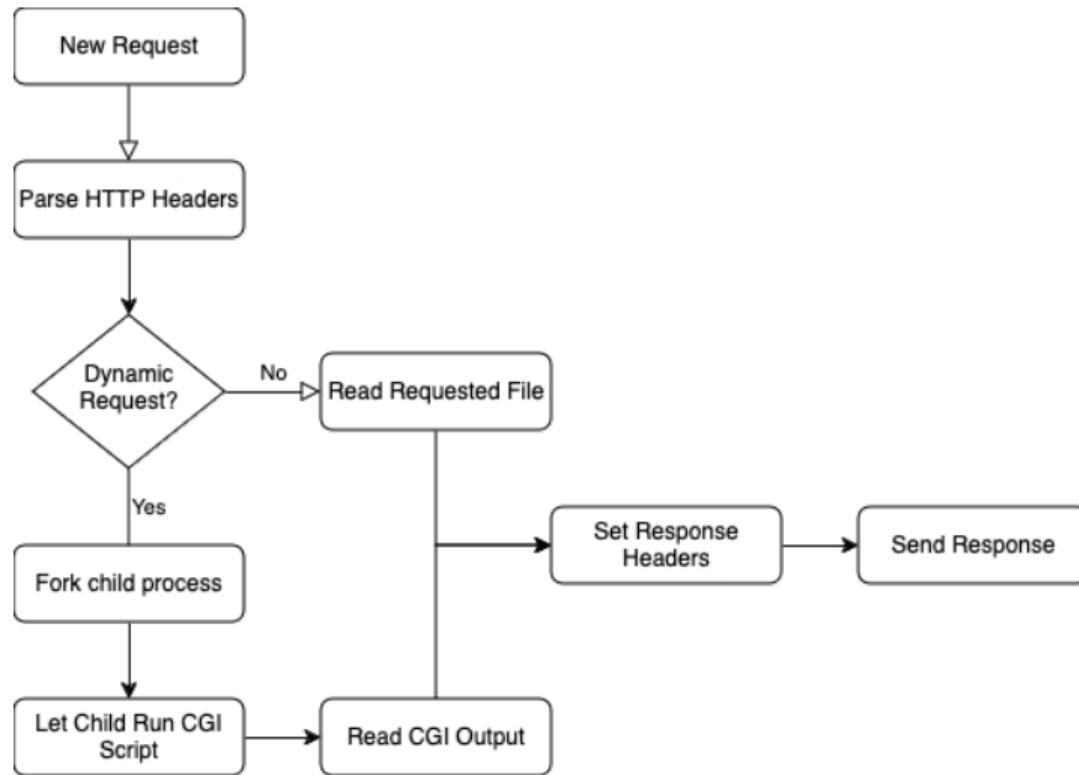
Features

- > Multiple Users can connect concurrently
- > Error handling
- > Process HTTP Requests (GET, POST, HEAD)
- > CGI (Common Gateway Interface) Support
- > Log web traffic
- > Multiple domain support
- > User Configuration
- > Containerization

Configuration: Multi domain support

```
[server]
1   address = "0.0.0.0"
2   port = 8888
3   workers = 8
4   log_file = "./logs"
5
6 [resource.cute]
7   domain = "kitty.ch"
8   root = "./yeet/dist"
9   cgi_bin_dir = "/usr/lib/cgi-bin"
10  [resource.cute.remaps]
11    "/api/messages" = "/cgi-bin/messages.cgi"
12    "/verycool" = "/cgi-bin/cool.cgi"
13
14 [resource.anotherdomain]
15   domain = "doggy.ch"
16   root = "./data"
17   cgi_bin_dir = "/usr/lib/cgi-bin"
18   [resource.anotherdomain.remaps]
19    "/yay" = "/cgi-bin/cgi"
```

Implementation: Conceptual Overview



Libraries

- > Hashmap
- > Logging
- > Threadpool
- > TOML Parser

Demo

THE BEST WEBSITE EVER

Lets talk about cats. What do you like about cats?

Rahel says: Katzen sind meine Lilibingstiere

Ephraim says: Ich bin ein Hund

Your name Say something nice about kit



Lessons Learned

- > OS Knowledge
- > C Programming
- > Reproducibility

Conclusion

- > Didn't look at the time plan, but we are very efficient spontaneous workers
- > From the initial project plan we implemented everything but Websockets.
- > Overall we are very happy with our results :)

Future Outlook:

- > Websockets
- > Security
- > fastCGI

Questions?