

Documentation for Project Framework

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1 Introduction

Source files can be found on https://github.com/KacperGawronski/project_framework

Project started as example usage of `socket.h`.

Next step was implementing handling of http request using Lua scripting language. When it was done, I noticed that it can script page generation structure and handle all requests. Project is on GNU GPL license, however, some external libraries might be on other licenses.

2 Dependencies

Basic project require:

- POSIX compliant system Basically project is targeted on GNU/Linux OS - Debian.
- Lua5.3 libraries and headers

Example worker also require:

- MariaDB dev files (C connector)
- jansson library and header files for database api

To run example project it is also required to have MariaDB installed, with example database from:

https://github.com/datacharmer/test_db

installation process can be found on:

<https://www.ibm.com/developerworks/library/l-lpic1-105-3/index.html>

then add user `exampleuser`:

```
CREATE USER 'exampleuser'@'localhost' IDENTIFIED BY '123';  
GRANT SELECT ON employees.* TO 'exampleuser'@'localhost';
```

3 Structure

3.1 webserver.c

webserver.c contains code that allow handling connections. It makes listening socket (by default on port 9090), and forwards accepted connections to threads based on worker function. It passes struct `stack_element`, taken from initialized stack, containing all required data to process connection. When connection is done, structure is pushed back on the stack by thread for further use.

By default, there is limitation 100 for number of threads, it's controlled by semaphore.

3.2 worker.c

function `worker()` handles connections. It reads sent data (by default only 10240 bytes), initializes Lua library as interpreter, and pushes on it additional C functions.

Example of adding C function to Lua scripting level:

```
lua_pushcfunction(L,generate_menu);  
lua_setglobal(L,"generate_menu");
```

Function should be defined as:

```
int name(lua_State * L){ (...) return number_of_returned_values }
```

Example functions are placed in `menu.c` and `mariadb.connector.c` files.

3.3 Page structure

Example page is described in following files:

- `example.lua`
Placed in `app/pages` directory. File contains page description - header definitions, javascript files to use and body
- `example.js`
Placed in `app/javascript` directory. File contains javascript which is run on page load.
- `style.css`
Global css file placed in `app/css` directory.
- `api.lua`
File describing json api, as for `api.json?[smth]` requests.
- `page_template.lua` File placed in `app` directory. It is used for processing every lua file in `app/pages` directory. It contains page structure definition.

Generally

- `worker` directory contains basic files for processing and handling requests - especially forwarding them to Lua interpreter.
- `app` directory contains definitions of what should be done with request.
- `app/GET.lua` Main file for processing GET request. It describes actions taken on specific GET requests. In this project, for example, it does file `app/pages/filename.lua` for request like `"/page?filename"`
- `app/page_template.lua` returns function which should be done by every page using defined table as argument.
- `app/pages` directory contains files describing pages, in format defined by `page_template.lua` code.
- `app/pages/pagename.lua` is file describing pagename site. It should define table as used by `page_template.lua`. Link to it will be generated by `generate_menu()` function as `page?pagename`. To add link in html you should simply write `page?filename` without extension (it will be added in code, prevents a little from hacking).
- `app/javascript` is main directory for javascript .js files. It won't automatically include js for every page, it needs to be defined in page file.
- `app/css` directory contains css files, and description of files included in every page in `requires.txt`.
- `json.api` contains file `api.lua`, which is called on GET `/api.json?[smth]` request. It is example of additional application.