Birzeit University - Faculty of Engineering Technology
Electrical & Computer Engineering Department – ENCS531
Real-Time Applications and Embedded Systems – 2nd semester - 2016/17

Project 1- submit before MAY 24th 2017

Real-Time Applications and Embedded Systems

You need to implement a simple web server. This web server should implement the minimum functionality to just serve the "GET" http request (other http requests are not required). The web server should:

1) Contain 1 main process and n worker processes (n is at least 1 and should be defined in the configurations file)
2) Contain a configuration file : a text file with the format where n, m and p are integers

```
Worker:  n

Connection: m

Port: p

# Comment
```

3) The main process creates the listening socket but does not accept connections, while the worker process(es) accepts the connections and handles the requests
4) Each worker process should handle m connections (where m is given in configuration file) the worker process should accept the connection read the request return the response without creating extra threads or forking new process, and serving the requests from one connection should not block other connections
5) In case of more than one worker process they should use the same listening socket
6) The main process should handle three signals
    i. SIGTERM : is used to stop the server, the stop steps are
        1. Worker processes should stop accepting new connections
        2. Worker processes should continue to handle current connections

3. When a worker processes have handled all connections and closed them it terminates and informs the main process. When all workers terminate the main process release all resources and terminate

ii. SIGHUP : is used to restart the server,, the steps are the same as stopping the server except before the main process terminates it starts a new instance of the server

iii. SIGUSR1: is used to reload the configuration file
    1. The worker processes stop accepting connections
    2. The main process starts a new instance of the server
    3. The old server instance performs the same steps as SIGTERM

Each group is required to perform the following tasks

1. Form a group of 3 students (no groups of 4 under any circumstance , groups of 2 might be accepted in certain cases)
2. Send me your group names and numbers on ritaj no later than Thursday 7/4
3. Research the HTTP protocol and decide the functionality needed to just handle GET request
4. Implement the http server under linux with the specifications in this document
5. You server is expected to handle 1000 concurrent connections
6. You can use the Siege benchmarking utility to test the performance of your server https://www.joedog.org/siege-home/
7. If you need help you can ask me or the TA
8. The will be a discussion for all group members after the submission date