MATSE Ausbildung

Project - Step 1: Build it

1 General Description

In this first step of the project, your task is to implement a secure system. The first step takes **2 weeks**.

2 Software Architecture

Your software architecture has to be a *client-server* architecture. The server will be used as a central component that is involved in every communication process and has to be able to handle an arbitrary number of clients.

3 Implementation Details

3.1 Clients

Each client models one *participant* in the communication network. A client is started using a configuration file in *JSON*-format, which looks as follows:

```
{
        "id": "ID",
        "password": "PASSWORD",
        "server":
        {
                "ip": "SERVER_IP",
                "port": "PORT"
        },
        "actions": {
                "delay": "DELAY IN SECONDS",
                "steps": [
                        "ACTION 1",
                        "ACTION 2",
                        "..."
                        ]
        }
}
```

After a client has been started, it registers at the server, providing its *id*. If the registration was successful, the server sends an acknowledgement. Otherwise, the server returns an error. After the server has acknowledged the registration, for each client the password is set and a counter is initialized at the server. Afterwards, the client starts to carry out the defined actions with *delay* seconds in between. An action can be one of the following:

- `INCREASE [AMOUNT]`

- `DECREASE [AMOUNT]`

Therefore, each client with a given *id* can only increase and decrease its own counter by an arbitrary amount. While a client is registered with its password, it has to be prevented that other clients register with the same id and another password. Two legit connections to the server in parallel are possible, however. Once a client (its last instance!) logs out, all information on that client is deleted on the server, i.e. the server works *stateless*.