Social Computing (SS 2018)

Exercise 1

Hand in until April 30, 2018, 14:15 via the L^{2}P-learning room

Please hand in a single PDF file including solutions for all tasks. Group submissions of 2-3 students are allowed. Please do not hand in alone. The sample solution will be discussed in the exercise class.

Task 1.1 (Restful Web Services)   (9 Points)
You want to start an online shop for hipster clothing. Since the lecture covered RESTful Web services, you want to create one for your application. Your shopping service has the resources *products* and *clients*. A *product* has a *name*, a *description* and a *brand*. A *clent* has a *first name*, a *last name*, a *street*, a *city*, a *post code* and a *country*.

a) Please describe the REST API specification of the RESTful Web service providing the two resources, using appropriate HTTP methods. You want to retrieve products, and create, update and remove users.

b) For each method list the necessary parameters.

c) Additionally, specify in total at least four different meaningful HTTP error- and success codes and returned objects where applicable.

Task 1.2 (Microservices)   (9 Points)
Your online shop has become a tremendous, world-wide success and your customer database is growing beyond expectations. To cope with this high amount of users, you need to reorganize your service by splitting your customer base into four different bases: Africa, the Americas, Asia-Pacific and Europe.

a) Specify, what kind of load balancer you would use to deal with this new setting.

b) Please redesign your RESTful Web service from the first task as a microservice architecture, taking into account the additional regional information. Use a UML component diagram. What are the challenges of such a distributed architecture?

Task 1.3 (Single Sign-On)   (7 Points)
To stay up-to-date with recent authorization and authentication technology, your online shop service should now support a single sign-on solution.

a) Please explain the difference between authorization and authentication. Give examples from your hipster clothing service for both concepts.

b) What happens on the HTTP level when using OAuth 2.0?

c) Please specify possible attack scenarios on single sign-on solutions and describe how two-factor authentication can help preventing them.