Aufgabenstellung

Rapid web migration prototyping using WebAssembly

Changing user expectations impose new requirements on existing software systems. The initial hurdle to transform existing software into web-based software, however, is high. In particular, Small and Medium (SME)-sized enterprises are reluctant to initiate this process. Reasons for this can be summarized in two categories: doubts about feasibility and doubts about utility. In the context of agile development, rapid prototyping has proven a suitable tool for addressing similar concerns. Therefore, this thesis investigates the idea of rapid migration prototyping, i.e. the quick creation of running web versions of existing legacy desktop applications with only limited resources.

Recent technologies such as WebAssembly (WASM) allow execution of legacy code in web browsers. The objective of this thesis is to employ Web Assembly for rapid web migration prototyping. To achieve this, the process of rapid web migration has to be defined in terms of activities, actors and artifacts. Possibilities of supporting these activities have to be identified and suitable supporting infrastructure needs to be created. Re-use of existing legacy application logic is important for rapid web migration prototyping. Challenges arise from supporting migration engineers in particular in two areas: communication with the server-side backend and interaction with DOM-based HTML user interfaces. Existing APIs in JavaScript and WASM have to be extended by suitable functionality to allow for easy creation of web-based prototypes.

The objective of this master thesis is to find an approach or a combination of approaches to solve the previously mentioned problem in the context WebAssembly and web migration. This particularly includes the state of the art regarding web migration and rapid prototyping. The demonstration of feasibility with an implementation prototype of the concept is part of this thesis as well as a suitable evaluation with exemplary use cases.