

Autonomously Migrating Services



motivation

Our environment is full of technical equipment. The amount of potential digital assistants grows every day. The capabilities of the sensors and actors in our environment are by far not exploited today. A common communication standard between all devices is missing. We are currently working on a platform that brings autonomous functionality into the home context. The autonomic capabilities are realized in form of control services that run on nodes with sufficient resources inside the network. As the services can provide (system) critical functionality, like the control of building security equipment, it has to be ensured that they will not fail when nodes fail. It is also desired that the services run in an optimal way, so on nodes that currently have sufficient free resources. Our functional services are logically situated on top of our already existing knowledge-based middleware. As it already makes location of information and devices transparent to the services they can be moved freely in principle.

your task

In this work functionality to run and move services dynamically inside the platform should be specified and implemented.

- Existing approaches/ related work
 - Which approaches of moving services inside a network do exist and are currently in use?
 - Which are existing algorithms for deciding on which node to place a service?
 - Which are existing algorithms for splitting and merging services?
 - Which are the domains this functionality is used today?
 - What are the prerequisites of the respective approaches?
- Specification
 - Which components are needed?
 - How can the solution be realized in the most decentralized way?
 - Which base functionality is needed for a service to be movable, splittable and mergable?
 - How can it be ensured that a service moves with no or minimized interruption?
 - How can the overall load be balanced?
- Implementation of the specified functionality on top of the knowledge middleware
- Evaluation of the approach on the base of test scenarios and measurements
- Summary and Outlook

required

JAVA, at least basic knowledge in operating systems, joy at working in a team

