



Redeployment of Real-Time Applications

Status quo

Service redeployment is a prerequisite for various use cases that must be fulfilled for the realization of Industry 4.0. In addition, many different types of services need to provide mobility and therefore require redeployment or reconfiguration in real-time. Among other things, these can be algorithms of mobile devices, such as unmanned vehicles or robots, security services, communication services, or classic control tasks. The latter in particular place very high demands on determinism and latency. Here, it is of utmost importance that the downtime of the service is as low as possible. Since existing live migration approaches try to optimize several metrics, such as downtime, migration time and energy consumption, which are equally relevant in the IT domain, it is not possible to use an existing approach for industrial applications.

Solution

For this reason, we developed a novel concept that builds on existing migration approaches and virtualization technologies and is primarily aimed at minimizing service downtime. In particular, the combination of migration using lightweight virtualization (containers) proved promising. Subsequently, strategies were developed specifically for the shop-floor level of production.

Our services

Presentation of the redeployment concept on a realistic and time-critical use case and industrial hardware.

A downtime of less than 1ms can be guaranteed. Depending on the initial state of the system and further requirements, the complete migration is completed after 500ms at the earliest, but after 2 seconds at the latest. This means that migration can be performed twice per second in the best case.

Supported by:



FabOS – open, distributed, real-time capable and secure operating system for production

Integration into FabOS project

Redeployment of services is an essential part of future applications. Simple and real-time redeployment can help to use cloud resources efficiently and to react to changes in the system that may not be foreseeable.

Your advantages

- Redeployment of industrial applications in real-time
- Enabling novel use cases, e.g. efficient integration of mobile devices
- Increased flexibility and resilience, e.g. if the state of the communication network changes
- Cost savings through the use of COTS hardware
- Increased energy efficiency through load balancing in industrial applications

Target group

Manufacturing companies that aim for an increased flexibility to make their company ready for Industry 4.0 and to implement new use cases and technologies.

Become part of the FabOS community

Does the idea of an operating system for production appeal to you? Either because you are interested in using it in your company or because you would like to be involved in its development?

Then sign up for the FabOS community and join our project:

www.fab-os.org/en/become-a-partner

- Frequent updates on progress and developments
- Regular information on news about the project
- Free and preferred participation in our workshops
- Direct opportunity to contribute requirements and feedback
- Access to data sets and templates for asset administration shells
- Option to test developed project software at an early stage

We are looking forward to exchanging ideas and hope to welcome you as an associated partner in the project soon.

The following project partner is involved in the exhibit:

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