

Bachelor/ Master Thesis

Applications of Service Oriented Architecture (SOA) for Machine Automation: An Industrie 4.0 Use

Current Situation

New IoT technologies and solutions e.g. Cloud computing and virtualization has recently emerged in many application areas comprising enterprise and industrial systems. They offer various solutions to provide a dynamic and flexible infrastructure to host the resources and deliver them as a service on-demand as the basis of Service Oriented Architecture (SOA).

Since industrial automation systems of the future need to be adaptable and agile, SOA and Virtualization of resources can be considered as a promising solution for this area. Competitive production costs and scalability of the automation systems would be an important topic for the industry 4.0. Machines are often consisting of distributed subsystems controlled by individual PLCs. Each new hardware component brings additional costs and maintenance efforts. The virtualization of industrial component's functionalities (e.g. PLC-as-a-service) could be a promising approach and can be used as well for simulation. Though, some inherent challenges such as accessibility and security needs to be addressed for industrial automation applications. In the presence of a comprehensive resource distribution policy, multiple instances of virtual devices and machines together with Virtual engineering tool (e.g. SoMachine-as-a-Service) can be created and allocated to control underlying physical subsystems.

Objective

In this thesis work, different SOA and virtualization platforms such as Hypervisors and Containers will be investigated for Machine use cases by considering how these services can be offered to the market.

For Building a successful "as-a-service" platform, a proper Service Level Agreement (SLA) need to be designed and communicated for each asset. For instance, Machine-as-a-Service aims to offer the machine as a digital service to the machine users. However, definition and monitoring of these services need to be clarified by different metrics and SLAs.

General Information

The thesis is offered in cooperation with the company Schneider Electric (<https://www.schneider-electric.de/>). During the master thesis you will have a full-time contract with Schneider Electric in Marktheidenfeld. You can start with your thesis as soon as possible.

Bei Interesse richten Sie bitte eine Kurzbewerbung an:

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