Reference:	**OPC-Client**
Topic:	**Web Client for an OPC UA server**
Lecture-Type:	Practical course, Seminar, Bachelor thesis
Start:	As soon as possible
End:	To be defined
Contact:	Felix Rinker (felix.rinker@tuwien.ac.at)
	Stefan Biffl (stefan.biffl@tuwien.ac.at)

Background

In automation systems flexible configuration of components and subsystems is of high interest by industry, such as required by Industrie 4.0 initiatives[1]. Components that support these requirements include self-aware and self-adaptable production system components for enabling intelligent networking and cooperative decision-making. With focus on practical applications, a migration path from existing production system architecture to flexible components is required.

AutomationML [1] provides a standardized XML-based data structure for storing and exchanging engineering data of automation systems, such as a production system. AutomationML includes the plant topology, geometric data, kinematics, and control logic. Beyond the specification of automation systems additional methods and tools are needed to support efficient data exchange based on semantic meanings of exchanged data.

OPC UA [2][3] is a machine-to-machine (M2M) communication protocol that support data description and propagation based on a semantic technologies, i.e., the meaning of available data is available and can be used in application. Note that OPC UA is also capable of handling runtime data.

The main goal of this topic is to design and develop a web frontend prototype to efficiently browse through engineering data based on AutomationML and OPC UA data based on an industry prototype. Figure 1 presents an overview on the architecture.

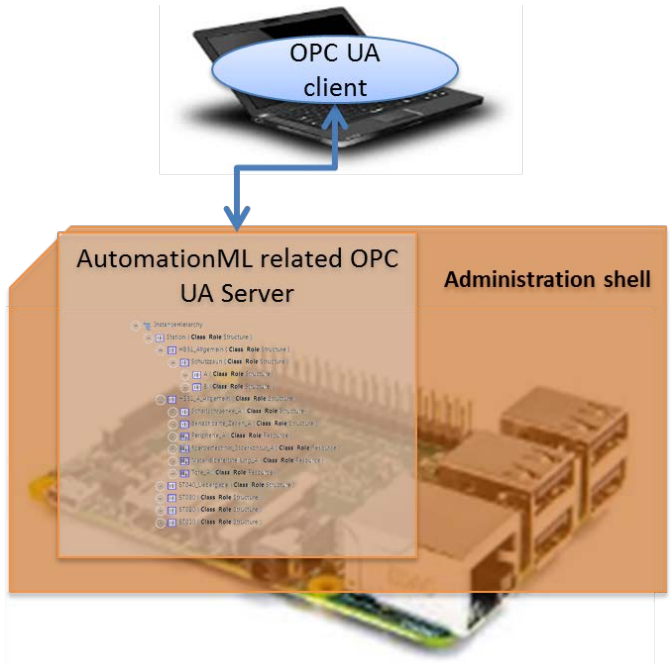

Figure 1: Web client to browse a production system structure in an OPC UA server.

[1] Industrie 4.0: http://www.hightech-strategie.de/de/Industrie-4-0-59.php

Tasks

Based on the overall goal, two specific tasks include:

- Design, develop, and evaluate a web interface to browse the structure and run-time data of a technical system provided by an OPC UA server interface in AutomationML format.
- Design, implement, and evaluate a web interface to set control parameters of a technical system via the same OPC UA server interface.

Expertise and Skills Needed

Based on different tasks, required expertise and skills may vary. For this project, the following skill set is recommended:

- Web User Interface design
- Software Engineering Skills
- Java and the standard technology stack (e.g., Build Tools, Issue tracker, SCM)
- Interest in test automation
- Nice to have: interest in OPC UA and/or AutomationML modeling

You will learn

- Automation systems engineering basics
- AutomationML and OPC UA in practice

References

[1] Drath R.: “Datenaustausch in der Anlagenplanung mit AutomationML“ Springer-Verlag Berlin Heidelberg, 1 Edition, 2010.

[2] Mahnke W., Leitner S-H, Damm M.: „OPC Unified Architecture“, Springer, 2009.

[3] Rinaldi J.S.: “OPC UA – Unified Architecture: The Everyman’s Guide to the Most Important Information Technology in Industrial Automation”, CreateSpace Independent Publishing, 2016.