

IoT with OPCA UA, MQTT und REST

The increasing networking of devices, machines and plants with backend systems form the basis for data-centered product benefits and business models. Concurrently for the connection of sensors, actors and control units open standards prevail in new application areas.

With experience and expertise we support our customers in the use of IoT protocols and technologies. Our engineers help to shorten the time-to-market. And their conceptual knowledge can be applied to make optimal use of the complexity and versatility of IoT technologies for new products.

Applications

OPC-UA based systems designed by emlix are to be found in innovative solutions for connection of various control systems with SCADA systems as well as remote with ERP systems.

MQTT solutions implemented by emlix transfer configuration and operating data from utility vehicles to the fleet operators' private cloud. They also provide machine-data to the SCADA system of the plant operator.

Based on RESTful webservices emlix implements HMI devices with HTML5 technology, Qt or Java Swing/FX. (»)

OPC UA Communication

Vertical and horizontal communication between various components of different manufacturers of automation systems becomes a lot easier using OPC-UA. It defines an uniform interface to realize complex control systems and structures. Design paradigm is a service oriented architecture (SOA).

OPC-UA becomes a platform and supplier independent standard for IoT systems based on established communication infrastructures. It provides integrated communication between sensor/actor and cloud.

For the development of specific IoT solutions based on embedded Linux and OPC UA we offer the following services:

- Design of system solutions and architectures
- Evaluation of performance and functionality of different OPC stacks
- Review and development of security mechanisms for OPC UA
- Development of application specific data models
- Integration of OPC UA client and OPC UA server
- Compilation of test environments and test cases

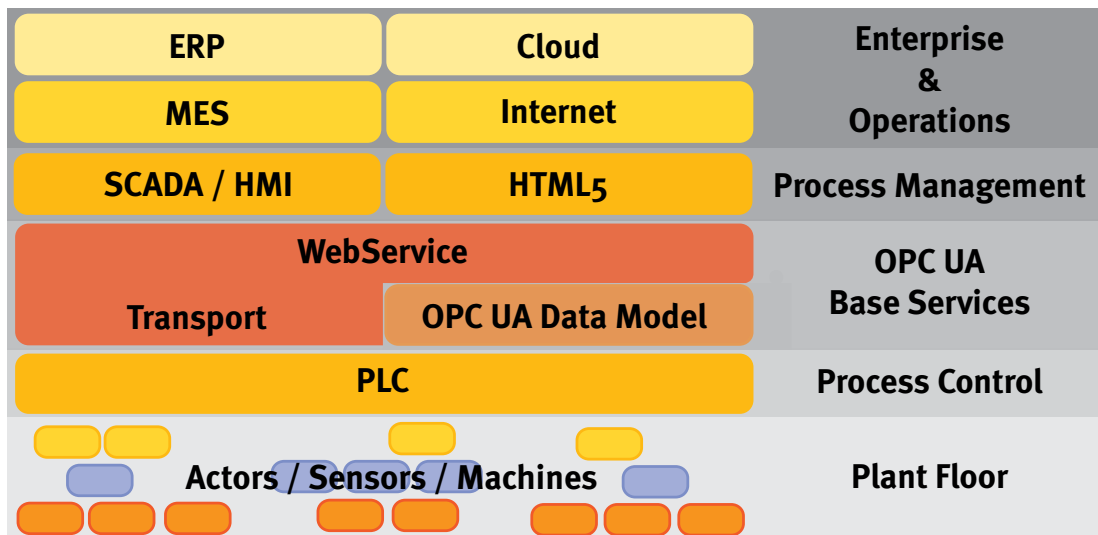


Fig. 1: OPC UA client-server architecture with Linux

(») The development of a middleware architecture for process control is part of the emlix portfolio as well as the connection of different components via RESTful webservices or their integration into industrial cloud services.

MQTT Cloud Integration

The MQTT protocol provides a efficient and robust data transmission even if the mobile radio connection is of low quality. Based on an event-driven approach MQTT is well suitable to simultaneously network some thousand devices with low data transmission costs.

For complex IoT and M2M systems MQTT offers an established and fully developed infrastructure for reliable transmission of communications. The implementation of complex requirements is made possible by different quality-of-service levels.

For the use of MQTT into your products we offer the following services:

- Design of system solutions
- Integration of MQTT client libraries and MQTT server
- Optimization for narrow bandwidth as well as unreliable networks
- Development of client objects and message handling
- Integration of security mechanisms
- Development of test cases and tests

RESTful Webservices

Developing IoT systems RESTful webservices are an established architectural basis to realize distributed information structures. Typical scenarios are for example the usage of an industrial HMI application on a mobile device as well as a panel PC. Another example is the integration of an HMI application additionally to a software infrastructure which already exists.

Based on RESTful webservices emlix implements HMI devices with HTML5 technology, Qt or Java Swing/FX. The development of middleware architectures for process control is part of the emlix portfolio as well as the connection of different components via RESTful webservices or their integration into industrial cloud services.

For development and use of RESTful webservices we offer the following services:

- Product specific development of RESTful system solutions
- Evaluation of different HTML5 Frameworks
- Definition and development of REST APIs
- Separation of server-sided and client-sided logic
- Development of webservices and HTML5 HMIs
- Implementation of HTTP authentication mechanisms
- Composition and integration to form maintainable board support packages

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