GenerIoT

Supporting IoT beyond deployment

The ITEA project GenerIoT (Generating and Deploying Lightweight, Secure and Zero-overhead Software for Multipurpose IoT Devices) aims to bridge the development and operations lifecycles by delivering DevOps for secure Internet of Things (IoT) systems. This will follow a Model Based Systems Engineering (MBSE) approach that ensures consistent system models for software implementation, device hardware and communication channels.

Addressing the challenge

In IoT architectures, sensors and actuators have limited autonomy within a distributed command structure; system responsibility for correct performance is spread across networks of devices. These devices also vary enormously in hardware, software and communication technologies. Inflexible implementations can therefore result in issues such as security compromises and complete failure. To reap the benefits of IoT as in Industry 4.0, processes have to be improved from initial conception to end of life, so that systems can be dynamically adapted to changing requirements and risks.

Proposed solutions

In order to provide better post deployment support, development and operations of IoT systems need to be merged in the future. Therefore GenerIoT will provide new technologies and processing steps to simplify and speed up the handling of IoT software over the DevOps cycle. For the development phase, an MBSE framework will be developed for multipurpose IoT and edge devices, that can be used in application areas as diverse as energy, agriculture and healthcare. The core component of this framework will be consistent system-level models to enable model-driven code generation and early system architecture analysis. A configurable prototyping environment will also enable early evaluation of the hardware, software and communication performance of IoT systems, while the framework will guide test automation using a comprehensive

model of system interactions.

Projected results and impact

The framework and the methods of GenerIoT will provide the groundwork to develop high-quality IoT systems with less effort. For example, the project aims to reduce time-to-market by 40% and overall engineering effort by 50%. Examples of new products and services include compact sensors and actuators as well as IoT apps. All are boosted by GenerIoT software generation and application. IoT manufacturers can take advantage of these innovations to add new services and functionalities to their portfolios and extend their market shares in a fast-growing domain, with the number of global IoT devices expected

to hit 24.1 billion in 2030 at a compound annual growth rate of 11%.

Finally, GenerIoT will standardise processes for IoT system deployment and field management. This renders it a truly complete solution for IoT DevOps.

Modeling and Automation for the Internet of Things

Project partners

Germany

Xentara

FZI

Infineon

Razorcat

ScopeSET
The Tools Experts

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