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Modelling protocol gateways for cyber-physical systems using Architecture Analysis & Design Language

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Abstract

Developing, configuring, and deploying legacy protocol gateways for existing cyber-physical systems to improve interoperability remains challenging. A possible solution is using model-driven engineering languages such as the Architecture Analysis & Design Language (AADL) that enables combined modelling of software, hardware, and communication for distributed systems. Experiences made while creating an OPC Unified Architecture (OPC UA) / Data Distribution Service (DDS) gateway indicate the suitability of AADL to model complex software artefacts. Moreover, a proposed process reduces the development and configuration effort for platform-specific gateway instances. A challenge to be addressed is the generation of executable code for resource-constraint devices.

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