

Model-Driven Generation of DSML Execution Engines*

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ABSTRACT

The combination of domain-specific modeling languages and model-driven engineering techniques hold the promise of a breakthrough in the way applications are developed. By raising the level of abstraction and specializing in building blocks that are familiar in a particular domain, it has the potential to turn domain experts into application developers. Applications are developed as models, which in turn are interpreted at runtime by a specialized execution engine in order to produce the intended behavior. This approach has been successfully applied in different domains, such as communication and smart grid management. However, each time the approach has to be realized in a different domain, substantial re-implementation has to take place in order to put together an execution engine for the respective DSML. In this paper, we present our work towards a generalization of the approach in the form of a meta-model and its respective execution environment, which capture the domain-independent aspects of runtime model interpretation and allow the definition of domain-specific execution engines as instances of the meta-model. We present an initial validation of the approach in the context of the Communication Virtual Machine project, by realizing part of the execution engine architecture in the form of an instance of the proposed meta-model.

Categories and Subject Descriptors

D.2.11 [Software Engineering]: Software Architectures—*domain-specific architectures, languages*

Keywords

Models at Runtime, Model-Driven Engineering, Domain-Specific Modeling Languages, Metamodeling, Middleware

1. INTRODUCTION

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2. BACKGROUND

3. GENERIC ARCHITECTURE OF THE EXECUTION ENGINE

4. META-MODEL FOR BROKER LAYER

5. EXECUTION ENVIRONMENT

6. EXAMPLE IN THE COMMUNICATION DOMAIN

7. RELATED WORK

8. CONCLUDING REMARKS

9. REFERENCES