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Project Title:

Autonomic Behavioral Aspects for Model-Driven Communication Application

Keywords:

Autonomic Computing, Model-Driven, Communication, Policy-Driven, Aspect-Oriented Programming

Collorators:

Dr. Jean-Marc Jezequel, Dr. Benoit Baudry, Loïc Lesage

Problem Statement:

Model Driven Development reduces the problem-implementation gap by redefining the role of models and using platforms for translating and realizing the application. Autonomic behavior (self-*) are important properties for enhancing reliability, consistency and manageability in collaborative communication. A challenging problem is how to introduce autonomic behavior into the models for the platforms to support model driven development. In this joint study project, the approach to the above problem will be to weave the adaptive behavioral aspects into the Network Communication Broker (NCB) of the Communication Virtual Machine (CVM).

Motivation and Impact:

While the development of autonomic behavior as aspects is not a new problem, the integration of autonomic behavior as a cross cutting concern in model driven development of communication application remains an open problem. This study will help us identify the key problem, point out future directions and potentially develop usable technologies.

Current Status:

Andrew A. Allen, the FIU PIRE participant that will be involved in this project, has been working on incorporating adaptive behavior into the NCB, the lowest layer of the CVM. CVM is a model driven development paradigm for the realization of communication intensive application models defined using a Communication Modeling Language.

Research Roadmap:

- Milestone1 / 2008-05-30 / Study Aspect Oriented Modeling (AOM) and dynamic weaving techniques for Autonomic Computing.
- Milestone2 / 2008-06-30 / Specification of the meta-model and the behavioral model in Kermeta for the NCB.
- Milestone3 / 2008-07-30 / Report on Experiments to compare the manual efforts required to implement the NCB versus generating the code using Kermeta.

Relation to PIRE Core Research Projects:

This project fits into the PIRE theme “Communication Virtual Machine”. The outlined problem involves developing self-management capabilities into the tool. This will facilitate domain experts including high level self-* goals for the application in the model. While the initial autonomic behavior will be that of self-configuration, with the experiences gained a framework for weaving other autonomic behavior would be developed as well.