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Ajout de mécanismes de réactivité au contexte dans les intergiciels pour composants dans le cadre d'utilisateurs nomades

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Abstract

The rapid evolution of mobile computing induced to new applicative needs to ensure the execution of the applications in dynamic environment. These applications called context-aware applications have to detect the environment changes and adapt their behavior accordingly. The development of such type of application is difficult to implement and requires main programming efforts.

Most of research works dealing with context and adaptation focus their efforts either in proposing context models for context description (application developer has to deal with context and adaptation), or in proposing platforms that interact with context and adapt the application to context changes without providing any meta-model for context description.

The goal of this work is to facilitate the development of component based context-aware applications. For this reason we proposed the CAMidO middleware (Context-aware Midleware based on Ontology meta-model). Our proposition provides both a meta-model for context description and a component based middleware which contains entities for context and adaptation management. The CAMidO meta-model contains description of common informations to all context-aware applications and application specific information. This description is used by a compiler to enable the automatic management of context and adaptation. In CAMidO, the adaptation granularity is the component. We consider two adaptation kinds : the reactive behavioral adaptation and the proactive behavioral adaptation. We used the component/container paradigm in order to manage these adaptation kinds using non functional properties. The CAMidO middleware can be executed in two modes : the static configuration mode and the dynamic reconfiguration mode. The static configuration mode considers only the initial descriptions of the application model, while the dynamic reconfiguration mode allows the middleware to consider all the application model changes carried out after its execution. In order to validate these propositions, we implemented a prototype of CAMidO on top of OpenCCM, and we have done qualitative and quantitative evaluations of this prototype.

Keywords : Context awareness, context modeling, ontology, adaptation, middleware, component.