

Towards an Implementation Model for FB-based Reconfigurable Distributed Control Applications

K. Thramboulidis, G. Doukas, A. Frantzis

Electrical & Computer Engineering,

University of Patras, 26500 Patras, Greece

Phone: +30 2610 996436, Emails: {thrambo,gdoukas}@ee.upatras.gr, afrantzis@upnet.gr

ABSTRACT: *The Function Block (FB) has been defined by the International Electro-technical Commission (IEC) as the basic construct for the development of reusable, interoperable, distributed control applications. Complete applications can be defined in the design level as networks of interconnected FBs. For these design models to be automatically converted to implementation ones, adopting the model integrated computing paradigm, an appropriate implementation meta-model should be defined. In this paper we describe two alternatives for the implementation of FB design models. The first one is based on RTLinux while the second one uses Real-Time UML as an intermediate representation towards the final implementation model. Both approaches support the dynamic re-configuration of the control application but the later is more flexible since it utilizes the automatic code generation feature of commercial CASE tools to automatically derive the implementation model of the control application. To improve the expressiveness of the design model and the efficiency of the implementation one, we propose a number of extensions to the IEC Execution Control Chart notation.*