



MORPHEUS

Abstract of D2.1.2: Revised Toolset Specification

CONTRACT NO	MORPHEUS IST 027342
TYPE OF DOCUMENT	Publishable abstract of D2.1.2
DATE	08/01/2008
ABSTRACT	This document is the abstract of the D2.1.2 It is available on the MORPHEUS public website
AUTHOR, COMPANY	Philippe Bonnot (TRT)
CONTRIBUTORS:	Elena Moscu (TUD) Marius Schoorel (ACE) Florian Thoma (UK) Nikos Voros (ICOM) Axel Schneider (Alcatel-Lucent) Uwe Pross (TUC) Bernard Pottier (UBO) Richard Taylor (CBLUE)
WORKPACKAGE	WP2
CONFIDENTIALITY LEVEL	RE
FILING CODE	MORPHEUS-TRT-D212-R71



The present D2.1.2 deliverable is the revised specification of the toolset. The objectives of this revised document is to specify toolset evolutions either planned for phase 2 in the initial description of work, proposed as an enhancement in second detailed implementation plan (DIP), more recently defined from experience from application and toolset development or recommended by experts at first year project review. The objective of these revisions is to improve the productivity allowed by the toolset, the performance and the flexibility obtained through the generated code.

The main principle of the toolset (as already given in specification D2.1.1 [1]) is to propose a software design approach consisting of compilation with acceleration handling features, RTOS with reconfiguration services, "spatial" design of the accelerated functions and formal methods.

The revised toolset specification keeps to a very large extent the initial specification. This revised version specifies new features targeting globally more parallelism and more flexibility to facilitate the platform programming and provide more performance. The main new features concern task acceleration in parallel threads compilation, dynamic scheduling and allocation, "spatial" design shared on several reconfigurable engines (HRE).

The deliverable presents new features in detail, module per module. For each case, the reasons justifying the new capabilities are given as well as a short technical description of the improvement.

Concerning compilation, OpenMP-based directives are presented as well as graphs produced with profile information for dynamic scheduling optimisation.

Concerning RTOS, the dynamic allocation is explained as well as the utilisation of graphs produced at compilation, the complementary services offered in case of an extended simulator provided by the architecture package and the new proposed dynamic memory management.

On "spatial" design side, mapping improvements and design on several HRE, new framework for simulation and function capture improvements are explained.

Regarding formal methods, assertion-based monitoring, DFG generation and model checking techniques evaluation are presented.

A summary of toolset limitations is also presented.

The MORPHEUS toolset concepts based on a performing software oriented approach should be reinforced through these improvements increasing openness, flexibility and performance.

User feedbacks received up to now are positive, but this toolset specification might be slightly adapted to further requirements that could occur during its utilisation.



Supported by the IST-Programme

Sixth EU Framework Programme for Research and Technological development