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Multiscale Programming and Execution Tools in the MAPPER project

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Printable Summary

The subject of this talk are the multiscale programming and execution tools [1,3] developed in the MAPPER project. The MAPPER project responds to the critical need by developing computational strategies, software and services for distributed multiscale simulations across disciplines, exploiting existing and evolving European e-Infrastructure. It is driven by the computational needs of seven exemplary multiscale problems from a variety of disciplines including Systems Biology, Fusion, Physiology, Engineering and nano-Material Science. The presented tools support composition of multiscale applications from existing single scale submodules installed on e-infrastructures [2]. After being composed, such applications are executed. The application structure is described in Multiscale Modelling Language. The tools include: the application composition tool called Multiscale Application Designer (MAD), Registry for application modules description implemented as MAPPER Memory (MaMe) and GridSpace (GS) Experiment Workbench tools supporting high level stage of application execution. We will present the current status of the tools working on the example of multiscale application [3].

[1] K. Rycerz, M. Nowak, P. Pierzchala, E. Ciepiela, D. Harezlak, and M. Bubak: Comparison of Cloud and Local HPC Approach for MUSCLE-based multiscale simulations. In Proceedings of The Seventh IEEE International Conference on e-Science Workshops, Stockholm, Sweden, 5?8 December 2011. IEEE Computer Society, Washington, DC, USA, 81?88.

[2] K. Rycerz, M. Bubak: Building and Running Collaborative Distributed Multiscale Applications. In Large-Scale Computing Techniques for Complex System Simulations Wiley Series on Parallel and Distributed Computing, W. Dubitzky, K. Kurowski, and B. Schott, Eds. Vol. 1. John Wiley & Sons, Chapter 6, 111?130, 2012

[3] K. Rycerz et al: An Environment for Programming and Execution of Multiscale Applications, ACM Transactions on Modeling and Computer Simulation, in review

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