



Diplomarbeit / Master Thesis

Splitting BPEL Processes

Globalization and the increase of competitive pressures created the need for agility in business processes, including the ability to outsource, offshore, or otherwise distribute its once-centralized business processes or parts thereof. Khalaf [1] described a concept to solve Business Process Outsourcing (BPO) in the context of BPEL. It is based on a variant of BPEL, called BPEL-D and produces BPEL processes. In short, BPEL-D is BPEL, where variables have been replaced with explicit dataflow. An overview is given by Khalaf [2].

The goal of this thesis is to extend the work of Khalaf to go from a BPEL process to a BPEL4Chor choreography: The split BPEL processes are participants in the generated BPEL4Chor choreography. The concept of choreography spheres [3][4] has to be used and eventually be adapted to model split BPEL scopes.

The thesis builds on the implementations of Gao [5] and Vazquez Fernandez [6]. Gao did a dataflow analysis on BPEL processes, which can be used as input for the splitting algorithm. Vazquez Fernandez developed a tool to split BPEL-D processes into BPEL processes.

Expected Results

- Concept to generate a BPEL4Chor choreography out of an annotated BPEL process.
- Design a fragmentation annotation for BPEL processes. The fragmentation annotation should be extensible for process merging [7].
- Implementation of a splitting algorithm and required modifications of existing code.
- Optionally: Web-based GUI
- Optionally: Extension of the choreography sphere coordination [4]

Required Previous Knowledge and Experiences

- BPEL, Java, UML, software engineering
- Or the declared intention to dive in these topics in advance

The student has to manage his schedule including this work packages and milestones for himself. A helpful guide for planning and writing a thesis can be found in [8] and [10]. The preferred language of the work is English, but German is accepted, too. In the latter case, [9] is to be consulted for good writing style.

Literature:

- [1] Khalaf, R. Supporting business process fragmentation while maintaining operational semantics: a BPEL perspective, Dissertation, University of Stuttgart, 2008
- [2] Khalaf, R. & Leymann, F. Role-based Decomposition of Business Processes using BPEL International Conference on Web Services (ICWS 2006), IEEE Computer Society, 2006, 770-780
- [3] Kopp, Oliver; Görlach, Katharina; Leymann, Frank: Extending Choreography Spheres to Improve Simulations. In: International Organization for Information Integration and Web-based Application and Services 2010 (iiWAS 2010).

- [4] Bors, Sergej: A Runtime for BPEL4Chor Cross-Partner-Scopes, University of Stuttgart, Faculty of Computer Science, Electrical Engineering, and Information Technology, Diploma thesis 2990, 2010.
- [5] Gao, Yangyang: Implementierung einer Datenflussanalyse für WS-BPEL 2.0, University of Stuttgart, Faculty of Computer Science, Electrical Engineering, and Information Technology, student thesis 2246, 2010.
- [6] Fernandez, J. V. BPEL with Explicit Data Flow: Model, Editor, and Partitioning Tool, University of Stuttgart, Faculty of Computer Science, Electrical Engineering, and Information Technology, Germany, Diploma thesis 2616, 2007.
- [7] Wagner, Sebastian; Kopp, Oliver; Leymann, Frank: Towards Choreography-based Process Distribution In The Cloud. In: Proceedings of the 2011 IEEE International Conference on Cloud Computing and Intelligence Systems.
- [8] J. Zobel. Writing for Computer Science. The Art of effective Communication. Springer. 2004.
- [9] P. Rechenberg. Technisches Schreiben. (Nicht nur) für Informatiker. Hanser Fachbuchverlag. 2006.
- [10] M. Deininger, H. Lichter, J. Ludewig, K. Schneider. Studien-Arbeiten – ein Leitfaden zur Vorbereitung, Durchführung und Betreuung von Studien-, Diplom-, Abschluss- und Doktorarbeiten am Beispiel Informatik. vdf Hochschulverlag AG an der ETH Zürich.

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