Tools4BPEL4Chor

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1 Tool Support for BPEL4Chor Choreographies

We present several tools support the modeling, analysis, synthesis, and correction of BPEL4Chor choreographies [1]. Fig. 1 presents an overview and the relationship between the tools.

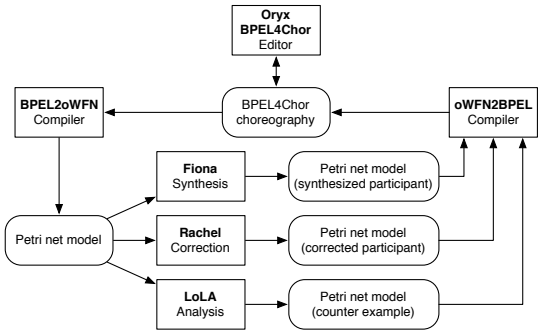

Fig. 1. Tool chains to analyze BPEL4Chor choreographies.

Oryx: Modeling Service Choreographies. Oryx is a graphical editing framework written in JavaScript developed at the Hassso-Plattner-Institute. A BPMN editor and a BPMN to BPEL4Chor transformation has been developed[3] so that a BPEL4Chor choreography can be modeled using configured BPMN [2]. That enables business users to graphically model choreographies without the need of writing XML code themselves.

BPEL2oWFN: Translating BPEL Processes into Service Models. To analyze a BPEL process or a BPEL4Chor choreography, it has to be translated into a mathematical formalism. In the Tools4BPEL framework, we use Petri nets as formal model. A feature-complete translation from BPEL processes into Petri net models [3] is implemented in the compiler BPEL2oWFN[4].

[3] Available at `http://www.bpel4chor.org/editor`.
[4] Available at `http://service-technology.org/bpel2owfn`.

LoLA: Analyzing Service Models. Petri nets allow for diverse analysis techniques. Furthermore, a lot of research has been conducted to ease the state space explosion problem that usually makes the analysis of real-world models impossible. The model-checking tool LoLA[5] [4] implements a variety of reduction techniques which allows, for example, deadlock checking of choreographies of thousands of participants [5].

Fiona: Synthesizing Service Models. While the analysis of choreographies may help to find design flaws in the interaction between all participating services, Petri net models may also support the design of choreographies. With the tool Fiona[6] [6], missing participants can be synthesized which are guaranteed to work deadlock-freely in the choreography.

Rachel: Fixing Service Choreographies. In case a service choreography deadlocks because of one participant, one solution might be to replace that participant by a synthesized participant. Though this replacement guarantees correctness, it gives no hint how to repair the incorrect participant. Rachel[7] is a tool providing such hints: It calculates the minimal edit actions necessary to change the participant to achieve deadlock-freedom.

oWFN2BPEL: Translation Service Models into BPEL Processes. To use the analysis results and the synthesized participants in the original BPEL choreography, the compiler oWFN2BPEL[8] [7] translates Petri net models into abstract BPEL processes. These processes already describe the business protocol of the BPEL process with its partners. Additionally details such as data aspects or fault handling can then be added manually to refine the process towards executability.

References

1. Decker, G., Kopp, O., Leymann, F., Weske, M.: BPEL4Chor: Extending BPEL for modeling choreographies. In: ICWS 2007, IEEE (2007) 296–303
2. Decker, G., Kopp, O., Leymann, F., Weske, M.: Modeling service choreographies using BPMN and BPEL4Chor. In: CAiSE '08, Springer (2008)
3. Lohmann, N.: A feature-complete Petri net semantics for WS-BPEL 2.0. In: WS-FM 2007. Volume 4937 of LNCS., Springer (2008) 77–91
4. Schmidt, K.: LoLA: A low level analyser. In: ICATPN 2000. Volume 1825 of LNCS., Springer (2000) 465–474
5. Lohmann, N., Kopp, O., Leymann, F., Reisig, W.: Analyzing BPEL4Chor: Verification and participant synthesis. In: WS-FM 2007. Volume 4937 of LNCS., Springer (2008) 46–60
6. Lohmann, N., Massuthe, P., Stahl, C., Weinberg, D.: Analyzing interacting BPEL processes. In: BPM 2006. Volume 4102 of LNCS., Springer (2006) 17–32
7. Lohmann, N., Kleine, J.: Fully-automatic translation of open workflow net models into simple abstract BPEL processes. In: Modellierung 2008. Volume P-127 of LNI., GI (2008) 57–72

[5] Available at `http://service-technology.org/lola`.
[6] Available at `http://service-technology.org/fiona`.
[7] Available at `http://service-technology.org/rachel`.
[8] Available at `http://service-technology.org/owfn2bpel`.