Model-Driven Automatic Generation of Verified BPEL Code for Web Service Composition

Bixin Li; Yu Zhou; Jun Pang;
Sch. of Comput. Sci. & Eng., Southeast Univ., Nanjing, China

ABSTRACT

Service composition, which provides a more effective way to combine several single services into a composite service, is a kind of software reuse techniques. However, one of the most important problems is how to perform service composition correctly and effectively so as to produce high-quality source codes for describing the resulted composite service. In this paper, we propose a model-driven method to solve this problem, where UML 2.0 sequence diagrams are extended to model the composition of Web services, extended statecharts are synthesized from sequence diagrams, then the statecharts are further transferred to the input language of a model checker for behavior consistency checking, and finally verified BPEL codes can be generated from improved sequence diagrams. Case studies have been performed to demonstrate the whole process and illustrate the significance of our approach.

INDEX TERMS

- IEEE terms
  Computer science, Protocols, Quality assurance, Software engineering, Software quality, TCPIP, Unified modeling language, Web and internet services, Web services, XML

- INSPEC
  - Controlled Indexing
    Unified Modeling Language, Web services, program verification, software reusability, source coding

  - Non Controlled Indexing
    BPEL code verification, Business Process Execution Language, UML 2.0 sequence diagrams, Web service composition, behavior consistency checking, composite service, model checker, model-driven automatic generation method, software reuse techniques, source codes, statechart synthesis

- Author Keywords
  BPEL code, Keywords-Model-driven, Verification, code transformation

REFERENCES


   Abstract [Full Text: PDF (192KB)]


