P.O.Box 8718, Beijing 100080, China	Journal of Software, June 2007,18(7):1582-1591
E-mail: jos@iscas.ac.cn	ISSN 1000-9825, CODEN RUXUEW, CN 11-2560/TP
http://www.jos.org.cn	Copyright © 2007 by *Journal of Software*

特征模型驱动的Web Services组装方案及其工具支持

邢 岩, 谷 放, 梅 宏

邢 岩, 谷 放, 梅 宏
(北京大学 信息科学技术学院 软件研究所,北京 100871)
作者简介: 邢岩(1979－),男,河北衡水人,硕士生,主要研究领域为软件工程,特征交互.谷放(1973－),男,博士生,主要研究领域为软件工程,领域工程.梅宏(1963－),男,博士,教授,博士生导师,CCF高级会员,主要研究领域为软件工程与软件工程环境,软件复用与软件构件技术,(分布)对象技术,软件工业化生产技术及系统.
联系人: 邢 岩 Phn: +86-21-50819100 ext 806, E-mail: xingyan@pku.org.cn, http://www.sei.pku.edu.cn/belljointlab/

Received 2004-06-28; Accepted 2006-08-14

Abstract
Web Services are gradually becoming main platform-independent software components and will widely exist in the distributed environment, INTERNET. This kind of software developing method that the creation of new software systems will mainly depend on Web Services composition is attracting more and more researchers' attention. There is still not a systematic and mature approach for Web Services composition which can be used to instruct the whole composition process. This paper provides a "feature model driven Web Service composition" approach, which makes Feature Model as the modeling tool to cross through the whole Web Services composition process and can be used to drive and direct all the phases in this process, including requirement analysis, business flow modeling, services composition, business flow deployment and execution. Then, combining with a concrete example, the basic idea, rationale and key steps of FWSC (feature model driven Web Services composition) solution are introduced. The work presented in this paper enhances the speed of modeling, development and quality of Web Services composition, and increases the abilities which can make the system dynamically adjust and quickly evolve when requirement changes.

Xing Y, Gu F, Mei H. Feature model driven Web services composition approach and its support tool. Journal of Software, 2007,18(7):1582-1591.
DOI: 10.1360/jos181582
http://www.jos.org.cn/1000-9825/18/1582.htm

摘要
Web Services正逐渐成为主流的平台独立的软件构件,并广泛地存在于INTERNET分布式环境中,通过组装Web Services生成系统的开发方法正在逐步引起人们的关注并受到重视,但目前还没有提出一套相对成熟的、系统化的组装方案用于指导Web Services组装系统的整个开发过程.将特征模型作为贯穿整个Web Services组装过程的模型工具,利用它驱动Web Services组装系统的需求分析、流程建模、组装、部署和执行,提出了"特征模型驱动的Web Services组装"解决方案,并结合一个具体的实例对FWSC(feature model driven Web Services composition)方案的基本思想、原理以及关键步骤进行了介绍.该工作可以有效地提高Web Services组装系统的建模、开发速度和质量,并增强Web Services组装系统在需求发生变化时的动态调整和演化能力.

基金项目：Supported by the Key Project of the National Natural Science Foundation of China under Grant No.60233010 (国家自然科学基金重点项目); the National Basic Research Program of China under Grant No.2002CB312003 (国家重点基础研究发展计划(973)); the National Science Foundation for Distinguished Young Scholars of China under Grant No.60125206 (国家杰出青年科学基金); the Major Project of Science and Technology Research of Ministry of Education of China under Grant No.MAJOR0214 (国家教育部重大科技项目)

References:

[1] Srivastava B, Koehler J. Web Service composition—Current solutions and open problems. In: Proc. of the 13th Int'l Conf. on Automated Planning & Scheduling (ICAPS 2003) Workshop on Planning for Web Services. 2003. 28-35. http://icaps03.itc.it/

[2] Berners-Lee T, Hendler J, Lassila O. The semantic Web. Scientific American. 2001. http://www.ryerson.ca/~dgrimsha/courses/cps720_02/resources/Scientific%20American%20The%20Semantic%20Web.htm

[3] McIlraith S, Son TC. Adapting golog for composition of semantic Web Services. In: Proc. of the 8th Int'l Conf. on Knowledge Representation and Reasoning (KR 2002). 2002. 482-493. http://kr.org/KR2002/

[4] The OWL Services Coalition. OWL-S: Semantic markup for Web Services. 2003. http://www.daml.org/services/owl-s/1.0/owl-s.html

[5] Limthanmaphon B, Zhang YC. Web Service composition with case-based reasoning. In: Schewe KD, Zhou X, eds. Database Technologies 2003 of the 14th Australian Database Conf. (ADC 2003) Conf. in Research and Practice in Information Technology, Vol. 17. Adelaide: Australian Computer Society, 2003. 201-208.

[6] Rachid Hamadi, Boualem Benatallah. A Petri net-based model for Web Service composition. In: Schewe K-D, Zhou X, eds. Database Technologies 2003 of the 14th Australian Database Conference (ADC 2003) Conf. in Research and Practice in Information Technology. Vol. 17. Adelaide: Australian Computer Society, 2003. 191-200.

[7] Carman M, Serafini L. Planning for Web Services the hard way. In: Proc. of the 3rd Int'l Symp. on Applications and the Internet (SAINT 2003) Workshop on Service Oriented Computing. Orlando: IEEE Computer Society Press, 2003. 27-31. http://www.saintconference.org/2003/saint_main.htm

[8] Bowen TF, Dworack FS, Chow CH, Griffeth N, Herman GE, Lin YJ. The feature interaction problem in telecommunications systems. In: Proc. of the 7th Int'l Conf. Software Engineering for Telecommunications Switching Systems. London: Institution of Electrical Engineers, 1989. 59-62. http://ieeexplore.ieee.org

[9] Davis AM. The design of a family of application-oriented requirements languages. IEEE Computer, 1982,15(5):21-28.

[10] Kang KC, Cohen SG, Hess JA, Novak WE, Peterson AS. Feature-Oriented domain analysis (FODA) feasibility study. Technical Report, CMU/SEI-90-TR-21, Pittsburgh: Carnegie Mellon University, 1990. 1-52.

[11] Zhang W, Mei H. A feature-oriented domain model and its modeling process. Journal of Software, 2003,14(8):1345-1356 (in Chinese with English abstract). http://www.jos.org.cn/1000-9825/14/1345.htm

[12] BPEL2003. 2003. http://www-106.ibm.com/developerworks/webservices/library/ws-bpel/

[13] Huang G, Wang QX, Cao DG, Mei H. PKUAS: A domain-oriented component operating platform. Acta Electronica Sinica, 2002, 30 (12A):39-43 (in Chinese with English abstract).

附中文参考文献:

[11] 张伟,梅宏.一种面向特征的领域模型及其建模过程.软件学报,2003,14(8):1345-1356. http://www.jos.org.cn/1000-9825/14/1345.htm

[13] 黄罡,王千祥,曹东刚,梅宏.PKUAS:一种面向领域的构件运行支撑平台.电子学报,2002,30(12A):39-43.