SEMANTIC WEB SERVICES AND PROCESSES:
SEMANTIC COMPOSITION AND QUALITY OF SERVICE

by

JORGE CARDOSO, CHRISTOPH BUSSLER & AMIT SETH

1 Tutorial Description

Web Services are increasingly being adapted by Enterprises as the new approach to component-based solutions for enterprise applications. They hold potential to transform Web from a collection of information resources to a distributed computing platform. Many enterprise applications, including those supporting e-commerce take a form of processes, which need to be created from individual Web Services and other software components. Web Services Modeling Framework (WSML) has been proposed as a full-fledged conceptual model for describing Web Services and their composition. Semantics is seen as the silver bullet in providing scalability and automation that result in productivity gains. In particular, Semantic Web Services and Process composition are emerging as important aspects of the Semantic Web vision. This tutorial looks this comprehensive conceptual model conceived as part of WSML, specification and role of Semantic Web Services, support for a critical component of Quality of Service, and use of semantics in process composition covering both functional and operational aspects. We look at both research and industry aspects of the tutorial topics.

- Web Services (Quick Introduction): standards and tools – XML, SOAP, WSDL, UDDI
- Web Services Modeling Framework
- Quality of Web Services: model (cost, time, reliability, fidelity) and specification
- Semantic Web Services: DAML-S and alternatives, with QoS specifications
- Process Specification: WFSL, …
- Semantic Composition: discovery, input-output matching
- Process Orchestration: adapting Workflow Management Systems, alternatives; monitoring QoS and adapting
- Application Examples: Supply-Chain, others
- Industry Overview
- Research Overview
2 Speaker Information

Jorge Cardoso, Amit Sheth, LSDIS Lab, Computer Science Department, University of Georgia

Christoph Bussler, Oracle Corporation

3 Short CV of the presenter

Jorge Cardoso received a B.A. (1995) and a M.S. (1998) in Computer Science from the University of Coimbra (Portugal), and a Ph.D. also in Computer Science from the University of Georgia (USA, August 2002).

His Ph.D. dissertation focuses on workflow QoS management and semantic composition of workflows. Research results were implemented in the workflow management system prototype METEOR. METEOR is a system oriented to support mission-critical enterprise applications requiring high scalability and robustness. It is fully distributed, scalable and includes multilevel security mechanisms. He has published several papers on workflow systems, workflow QoS, and semantics composition of workflow.

Dr. Christoph Bussler is the co-leader of Web Services Modeling Framework initiative with Prof. Dieter Fensel. He is a lead architect of Oracle’s Application Server product. He has extensive research and practical experience in the area of workflow process management.

Prof. Amit Sheth joined the UGA and started the LSDIS lab in 1994. For nine years before that, he served in R&D groups at Bellcore (now Telcordia Technologies), Unisys, and Honeywell. In August 1999, Sheth founded Taalee, Inc., a Venture Capital funded Semantic Web enterprise software startup based on the technology developed at the LSDIS lab. He managed Taalee as its CEO until June 2001 when it was acquired by Voquette, Inc. He has also founded another high-tech company—Infocosm, Inc. His research has led to several commercial products and applications, including SCORE technology based Enterprise Semantic Platform and Knowledge Tagger. He has published over 125 papers and articles, given over 100 invited talks including 11 keynotes, (co-)organized/chaired seven conferences/workshops, served on over 60 program committees, holds two patents, etc.

Speakers’ Selected Publications:

Cardoso, J. (2002). Quality of Service and Semantic Composition of Workflows. Ph.D. Dissertation. Department of Computer Science, University of Georgia, Athens, GA.


Cardoso, J. and A. Sheth (2002). Process Quality of Service Specification. EI3-IC workshop at NIST, Gaithersburg, MD.


4 Technical requirements

For the tutorial the following equipment is necessary: LCD projector.

5 Supporting material to be distributed at the symposium

A copy of the slides shown will be distributed to the participants. A Web Resource will provide additional tutorial reading material and resources to the attendees.