Abstract—The fifth Middleware for Web Services (MWS) workshop in 2009 is being held at the EDOC 2009 conference in Auckland, New Zealand. The workshop aims to bring together practitioners and academic researchers interested in the advancement of Web services and middleware technologies. This year, the five selected papers represent the new role and challenges middleware and Web services are faced with in light of a rapidly evolving environment which now includes cloud computing, virtualisation and mobile sensors.

Keywords—middleware, web services, service-oriented computing, service architecture, cloud computing

I. INTRODUCTION

The Middleware for Web Services (MWS) 2009 workshop was held on 1st September in Auckland, New Zealand, in conjunction with the Thirteenth IEEE International EDOC Conference.

Middleware is a well-established and prominent topic in enterprise computing. In recent years, Web services have continued to mature and play a key role in current middleware enabling technology. For this reason, since 2005, the Middleware for Web Services (MWS) workshop has been organised as a satellite event at EDOC. The workshops have been very well-received by academics, industry practitioners and government researchers. The aims of MWS 2009 are to: continue the important work from previous successful workshops, foster discussions in Web services and middleware technology, and identify new challenges in the area.

Recent trends have created a rapidly evolving environment for middleware. Dramatic increases in the availability of mobile devices and embedded/networked sensors, and the rapid emergence of cloud computing and server virtualisation (such as Platform as a Service, Infrastructure as a Service and Software as a Service) raise significant new challenges for the field.

The five full papers chosen for MWS 2009 represent a range of topics, reflecting the new role and challenges middleware and Web services are faced with. Research papers were selected after a thorough peer-review by the workshop Program Committee members and external reviewers. Every paper was reviewed by 3 to 5 international experts whose identity was not revealed to the authors.

The first paper is “Decentralised Data Dependency Analysis for Concurrent Process Execution” by Susan D. Urban, Ziao Liu and Le Gao (Texas Tech University, USA). The authors present a technique used to perform dynamic analysis of ‘write’ and ‘potential read’ dependencies among concurrently executing processes in a service-oriented environment. The approach is based on the concept of Process Execution Agents (PEXAs) which are responsible for controlling the execution of composed web services. PEXAs are associated with specific distributed sites to capture deltas (data changes) that occur at host sites using Delta Enabled Grid Services. PEXAs then exchange this information with other PEXAs to discover data dependencies and help recovery activities. The paper addresses a very important problem given that enterprise systems are moving towards Grid and cloud-based deployments.

The second paper is “Database Synchronization as a Service” by Christof Lutteroth and Gerald Webber (University of Auckland, New Zealand). The authors present the PDStore system, which is a novel change control and database synchronisation technology. The system represents all data in the parsimonious data model (PDM) and maintains globally unique identifiers (GUIDs) for all instances of an entity type. It provides idempotent and transactional change control operations that manage changes on a fine-grained level, as well as caching support across the distributed client applications. The synchronisation component in PDStore is offered as a service to its clients, enabling the service-oriented design of a system architecture for mobile enterprise applications. The technology is already deployed in a municipal database system for earthquake safety assessment data.

The third paper is “Performance Modelling Power Consumption and Carbon Emissions for Server Virtualization of Service Oriented Architectures (SOAs)” by Paul Brebner,
Liam O’Brien, Jon Gray (NICTA, Australia). The authors provide an overview of a Service Oriented Architecture performance modelling approach developed at NICTA. The proposed approach provides insights into the relationship between workloads, services, and resource requirements and how to predict server power consumption and carbon emissions. Using the model, the paper presents an evaluation study of the impact on carbon emission of different server deployment scenarios, including optimised resources, server virtualisation and cloud computing (Amazon EC2).

The fourth paper is “Web Services-Based Architecture for RFID Applications” by David Sundaram (University of Auckland, New Zealand), Schalk Pienaar (ESCP Europe, France), Wei Zhou (University of Auckland, New Zealand), Selwyn Piramuthu (University of Florida, USA). The authors present a Web Services based architecture for embedding RFID tags into enterprise applications. The paper summarises the opportunities and challenges presented by RFIDs and Web services standards, and presents a service orchestration architecture that enables linking loosely-coupled components to form a service (value) chain that utilises RFID data within and across organisational boundaries.

The last paper is “Monitoring Safety Properties of the Composite Web Services at Runtime Using CSP” by Mohsen Khaxar, Saeed Jalili, Narges Khakpour (University of Tarbiat Modares, Iran) and M. Shaban Jokhio (University of Auckland, New Zealand). The authors propose a method for runtime monitoring of composite services behaviour using Communicating Sequential Processes (CSP). In the approach, the safety properties of composite services are specified in CSPs which are, then, transformed to deterministic, augmented Labeled Transition Systems. The generated LTS system is traversed at runtime in order to validate the properties against the event generated from a BPEL engine.

We hope that the workshop will continue to contribute to the exchange of knowledge and ideas, furthering discussion on the research and development in the exciting and challenging area of middleware for Web services.

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