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Frontiers of High Performance Computing and Networking – ISPA 2006 Workshops

LNCS 4331

ISPA 2006 International Workshops
FHPCN, XHPC, S-GRACE, GridGIS, HPC-GTP
PDCE, ParDMCom, WOMP, ISDF, and UPWN
Sorrento, Italy, December 2006, Proceedings

Springer

Lecture Notes in Computer Science 4331

Commenced Publication in 1973
Founding and Former Series Editors:
Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

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Proceedings

Springer

Volume Editors

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Library of Congress Control Number: 2006937143

CR Subject Classification (1998): F.1, F.2, D.1, D.2, D.4, C.2, C.4, H.4, J.3

LNCS Sublibrary: SL 1 – Theoretical Computer Science and General Issues

ISSN 0302-9743
ISBN-10 3-540-49860-5 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-49860-5 Springer Berlin Heidelberg New York

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 11942634 06/3142 5 4 3 2 1 0

Context-Broker Service Architecture for AmI Systems Through Mobile-Agents and Ontologies as Middleware

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Abstract. Semantic web is mainly addressed to distributed web systems development. The semantic web organizes the information in a way that it is possible to find it even the amount of data is enormous. The semantic web provides a way to transform the information into knowledge by storing the data in concepts related by their meaning. This work-in-progress paper is going to show that this technology eases the construction of autonomous systems through agents. Particularly, we have developed an agent-oriented context-broker architecture that implements a smart conference room. The main contribution of the paper is the emulation of an ambient intelligent system, where mobile agents are working with well-defined ontology knowledge. Ontologies represent the main layer in the semantic web architecture. Thus, we use the ontology engineering features to represent a middleware infrastructure.

1 Introduction

Nowadays, World Wide Web (WWW) contains a lot of information but in many cases it is either redundant or simply not correct [1]. Searching for a specific content over the WWW through a syntactic search engine may result on an enormous amount of data, but very little useful information. Obviously, this unfortunate situation is caused by the search engine and the knowledge-representation, which is based on word matching and not on word *meaning* [2]. For example, if we look for a paper about García Márquez, we may find dozens (even hundreds) of articles written by García Márquez but we will surely have to look up in the list which exactly are about him. The semantic web tries to fix this kind of problems by means of semantic concepts management. The semantic web organizes the information in a way that it is possible to find it even the amount of data is enormous. The semantic web provides a way to transform the information into knowledge by storing the data in concepts related by their meaning. The semantic web development is based on several technologies, e.g. the Resource Description Framework (RDF) and the Ontology Web Language (OWL).

G. Min et al. (Eds.): ISPA 2006 Ws, LNCS 4331, pp. 907–916, 2006.

Acknowledgement

The authors acknowledge the partial financial support of this research through the programme *Accions especials del Govern de les Illes Balears* from *Conselleria d'Economia, Hisenda i Innovació.*

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