

*Commenced Publication in 1973*

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

## Editorial Board

David Hutchison

*Lancaster University, UK*

Takeo Kanade

*Carnegie Mellon University, Pittsburgh, PA, USA*

Josef Kittler

*University of Surrey, Guildford, UK*

Jon M. Kleinberg

*Cornell University, Ithaca, NY, USA*

Friedemann Mattern

*ETH Zurich, Switzerland*

John C. Mitchell

*Stanford University, CA, USA*

Moni Naor

*Weizmann Institute of Science, Rehovot, Israel*

Oscar Nierstrasz

*University of Bern, Switzerland*

C. Pandu Rangan

*Indian Institute of Technology, Madras, India*

Bernhard Steffen

*University of Dortmund, Germany*

Madhu Sudan

*Massachusetts Institute of Technology, MA, USA*

Demetri Terzopoulos

*New York University, NY, USA*

Doug Tygar

*University of California, Berkeley, CA, USA*

Moshe Y. Vardi

*Rice University, Houston, TX, USA*

Gerhard Weikum

*Max-Planck Institute of Computer Science, Saarbruecken, Germany*

Dirk Draheim Gerald Weber (Eds.)

# Trends in Enterprise Application Architecture

VLDB Workshop, TEAA 2005  
Trondheim, Norway, August 28, 2005  
Revised Selected Papers



Springer

Volume Editors

Dirk Draheim  
Freie Universität Berlin  
Institute of Computer Science  
Takustr. 9, 14195 Berlin, Germany  
E-mail: draheim@acm.org

Gerald Weber  
The University of Auckland  
Department of Computer Science  
38 Princes Street, Auckland 1020, New Zealand  
E-mail: g.weber@cs.auckland.ac.nz

Library of Congress Control Number: 2006921983

CR Subject Classification (1998): H.2, H.4, C.2, H.3, J.1, K.4.4, I.2.11

LNCS Sublibrary: SL 3 – Information Systems and Application, incl. Internet/Web and HCI

ISSN            0302-9743  
ISBN-10        3-540-32734-7 Springer Berlin Heidelberg New York  
ISBN-13        978-3-540-32734-9 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

Springer is a part of Springer Science+Business Media  
springer.com

© Springer-Verlag Berlin Heidelberg 2006  
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India  
Printed on acid-free paper    SPIN: 11681885    06/3142    5 4 3 2 1 0

# Preface

TEAA 2005 (Trends in Enterprise Application Architecture) took place as a workshop of the conference VLDB 2005 (31st International Conference on Very Large Databases) in August 2005 in Trondheim, Norway.

Enterprise applications are mission critical for organizations. Currently there are several initiatives that see enterprise application integration as their natural playground, like Model Driven Architecture and Service Oriented Architecture. Now is the time to investigate how these approaches can provide added value. At TEAA 2005 the contributions identified a problem or issue in enterprise application architecture and proposed and evaluated a solution. The workshop benefited from lively discussions among the participants.

Applications, operating systems, database systems, hardware architecture and system administration concepts must be orchestrated to yield an optimized system architecture that tackles performance, stability, security, maintainability, and total cost of ownership. In practice, it is always a holistic view that is needed – it is known that system design approaches that overemphasize one of the software or hardware architecture aspects are likely to fail. In the TEAA 2005 workshop we examined the conceptual underpinnings of enterprise application architecture.

We are grateful to our keynote speaker Laura Haas for sharing her insights with us.

November 2005

Dirk Draheim  
Gerald Weber

# Organization

## Program Committee Chairs

Dirk Draheim  
Gerald Weber

Freie Universität Berlin, Germany  
University of Auckland, New Zealand

## Program Committee

Ilkay Altintas  
Thomas Arts  
Rajendra Bose  
Mark van den Brand  
Judith Cushing  
Gill Dobbie  
Barry Dowdeswell  
Hannes Federrath  
James Frew  
Martin Große-Rhode  
Richard Hall  
Christoph Hartwich  
Josva Kleist  
Christof Lutteroth  
Teresa Mallardo  
Frank Maurer  
Josephine Micallef  
Jan Newmarch  
Uday Reddy  
Wolfgang Rother  
Narendra Shiva,ji Chaudhari  
Marcin Sikorski  
Gerd Wagner  
Rajeev Wankar  
Yanchun Zhang

University of California, San Diego, USA  
IT University of Göteborg, Sweden  
University of Edinburgh, UK  
Hogeschool van Amsterdam, Netherlands  
The Evergreen State College, USA  
University of Auckland, New Zealand  
AARN Innovation Limited, New Zealand  
Universität Regensburg, Germany  
University of California, Santa Barbara, USA  
Fraunhofer ISST, Germany  
Laboratoire LSR-IMAG, France  
Stamford Consultants, Switzerland  
Aalborg University, Denmark  
University of Auckland, New Zealand  
Università degli Studi di Bari, Italy  
University of Calgary, Canada  
Telcordia Technologies Inc., USA  
Monash University, Australia  
University of Birmingham, UK  
IBM Deutschland, Germany  
Nanyang Technological University, Singapore  
Gdansk University of Technology, Poland  
Universität Cottbus, Germany  
University of Hyderabad, India  
Victoria University, Australia

# Table of Contents

Building an Information Infrastructure for Enterprise Applications <i>Laura Haas</i> .....	1
Evaluating Integration Architectures – A Scenario-Based Evaluation of Integration Technologies <i>Stephan Aier, Marten Schönherr</i> .....	2
Integrating a Software Product Line with Rule-Based Business Process Modeling <i>N. Ilker Altintas, Semih Cetin</i> .....	15
A Middleware Architecture for Supporting Adaptable Replication of Enterprise Application Data <i>J.E. Armendáriz, H. Decker, F.D. Muñoz-Escóí, L. Irún-Briz, R. de Juan-Marín</i> .....	29
MDA and Analysis of Web Applications <i>Behzad Bordbar, Kyriakos Anastasakis</i> .....	44
A Message Exchange Architecture for Modern E-Commerce <i>Barry Dowdeswell, Christof Lutteroth</i> .....	56
Architecture for Distributed ERP Systems <i>Lars Frank</i> .....	71
Influence of Balancing Used in a Distributed Data Warehouse on the Extraction Process <i>Marcin Gorawski, Pawel Marks</i> .....	84
OLAP Schemata for Correct Applications <i>Hans-Joachim Lenz, Bernhard Thalheim</i> .....	99
Towards a Secure Data Stream Management System <i>Wolfgang Lindner, Jörg Meier</i> .....	114
An Efficient Zoning Technique for Multi-dimensional Access Methods <i>Byunggu Yu, Seon Ho Kim</i> .....	129
<b>Author Index</b> .....	145