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International Symposium on Distributed Objects and Applications — DOA’99

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Preface

Distributed object systems are increasingly used within diverse IT organizations. These systems offer many promises for their use in various applications, including telecommunications, distribution, manufacturing, web-based news and media systems, and more recently banking applications. They provide solutions to technical problems, including interoperability across different software and database platforms. Distributed object systems are generally built according to different paradigms and architectures, such as OMG’s CORBA and other object request broker principles and implementations, and proprietary technologies such as Sun’s Java and Microsoft’s COM, to provide a basis for building complex distributed applications.

As for other systems, such as database systems, the future success of distributed object systems will be not only dependent on how the basic requirements (to develop open, scalable and reliable distributed and heterogeneous applications and platforms) are met but also how the underlying distributed object technology can be integrated with existing complementary technologies and applications, such as WWW, multimedia and databases. Also legacy systems may sometimes substantially benefit from a reengineering effort using distributed objects, e.g. to turn them into data warehouses.

The 1999 IEEE International Symposium on Distributed Objects (DOA’99) focus is on both the fundamentals problems of distributed object systems as well as their practical use and evaluation for real world applications. The aim of the symposium was to provide a forum for both researchers and practitioners in such systems to be able to evaluate existing ORB middleware products; to propose solutions to major limitations of existing products; and to introduce promising future research directions for distributed objects. A special emphasis was particularly put on the evaluation of existing distributed object systems and how they are used to design and to implement large scale industrial distributed applications. Specifically, the topics and the issues of the symposium included: distributed business objects, distributed and mobile agents, database services (in particular persistency, transaction, query and replication services), intelligent traders, interoperability-supporting environments, design of CORBA, COM- and Java-based broker applications, multimedia distributed objects, multicast protocols for distributed object, object caching, reliability, fault-tolerance and recovery, real-time ORB middleware, security, and specification and enforcement of quality of service.

Eighty one papers were submitted to the DOA’99 symposium, and all of them were related to distributed object systems. Every paper was submitted in full and read by three referees who are experts in the area of distributed objects and they are also accustomed to conference and journal refereeing. Any paper with a little
doubt was discussed amongst the PC chairs, and in some cases, involved the referees. At the end of the selection process, we have selected 38 papers. The feedback process gave time to authors of accepted papers to address the questions of the referees and to improve their papers before publication. The result of the selection gave interesting and valuable set of papers contained in the proceedings, for which we must congratulate and thank their authors.

The DOA’99 symposium includes research papers, case studies and two keynote speeches from two eminent experts in the area of distributed objects (Michael Brodie and Al Issa). The research papers propose solutions to some of the major issues of distributed objects, including performance, bindings, load balancing, fault tolerance, replication and quality of service. Case studies describe the author’s experiences in using distributed objects in industrial applications, such as high energy and nuclear physics (HENP).

The first keynote speaker of the DOA’99 is Dr. Michael Brodie, who is a senior technologist at GTE. His work is on large-scale strategic Information Technology challenges for GTE and he has authored over 120 books, chapters, journal articles and conference papers. His keynote speech at DOA’99 is on the topic of “The Coincidental Confluence of Economics, Business, and Collaborative Computing.” The second keynote is from Al Issa, the director of Software Development and Application Services at CNN Interactive. He is responsible for software development and operations for the following CNN Web sites: CNN.com, CNNenEspanol.com, CNNemPortugues.com and AllPolitics.com. Issa oversees a team of 15 software developers and 20 Web staffers who design and implement key components of CNN Interactive content. Al Issa’s keynote covers one the experience of CNN Interactive in developing distributed object-centric CORBA based for web-publishing environments.

Last, but not least, we would like to thank all the people who made this symposium such a success, including the authors, the program committee, the general, publicity and organizing chairs. Without their essential input this symposium would, of course, not have been possible. To you and to all those who did not have the opportunity of attending the DOA’99 symposium, we are please to offer these proceedings as a snapshot of the sate of distributed object research and practice today. We hope you will find it a valuable reference and a source of inspiration for new ideas.

Zahir Tari, Robert Meersman, Richard Soley, and Omran Bukhres
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June, 1999
Organization Committee

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Middle East Technical University, Turkey

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Ling Liu (Oregon Graduate Institute, USA)
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Tom Northcutt (NASA, USA)
Kunio Ohno (INS Engineering Corporation, Japan)
Tamer Ozsu (University of Alberta, Canada)
Mike P. Papazoglou (Tilburg University, The Netherlands)
Kerry Raymond (DSTC, Australia)
Jean-Bernard Stefani (France Telecom, France)
Hakki Toroslu (Middle East Technical University, Turkey)
Irv Traiger (IBM Santa Teresa Lab, USA)
Arkady Zaslavsky (Monash University, Australia)
Roberto Zicari (Johann Wolfgang Goethe-Univ., Germany)
Wilfried Verachtert (MediaGenix, Belgium)
Andreas Vogel (Inprise Corp, USA)
Andrew Watson (OMG, USA)
Additional Referees

Michael Beck
Andreas Behm
Boualem Benatallah
Andrew Berry
P. Dechamboux
Keith Duddy
David Edmond
Guray Erus
Murat Ezbiderli
H. Fritschi
C. Hamon
Pinar Karagoz
Markus Kradolfer
Cengiz Icdem
Sven-Eric Lautemann
Michael Lawley
Quang LeViet
Song Wai Loke
Brahim Medjahed
Stephen Milliner
Zoran Milosevic
Mourad Ouzzani
Roberto Pizzi Cannella
Claus P. Priese
A. Rakotonirainy
Nesime Tatbul
Dimitrios Tombros
Anca Vaduva
Andrew Wood
Ling Ling Yan
Keynotes

Keynote I: Que Sera Sera: The Coincidental Confluence of Economics, Business, and Collaborative Computing

Dr. Michael L. Brodie, Sr. Technologist, GTE Technology Organization

Abstract

“The World Wide Web (WWW) changes everything.” But how? Amazon.com and eBay as exemplars of e-business do not begin to suggest what is possible. Technologists often think of technology change in technological terms. Technology serves to realize more significant changes such as the way business is conducted. More radical and more fundamental changes are those related to new economic models that underly, predict, and enable new business models and which define technology requirements. The potential offered by the next generation of technology will take at least a decade to understand and realize, since it involves fundamental change not only in computing models and practice but also in business and economics. Success requires overcoming major challenges such as distributed computing which simply does not exist in any scalable sense. Distributed object computing and applications, a wonderful idea, which if not superseded will manifest in a decade since it must scale up several orders of magnitude. The current industrial revolution will also lead to significant social and political change. This is a time of radical change in what appears to be the parallel worlds of technology, business, and economics. They are not parallel. The intimate relationship of these domains has previously resulted in collateral homeostasis due in part to their interdependence. Current changes in these domains are leading to collateral change. This presentation focuses on the confluence of these changes. As technologists, we see technology and related business change daily. Economic change is less obvious but more radical. Current technology is designed to support 400-year-old economic models, which involve managing within organizational boundaries. It is inadequate to support new economic models, which involve going beyond those boundaries.

This presentation explores the next generation of computing based on the confluence of radical and coincidental changes in economics, business, and technology. Whereas technology is a key enabler of change, it is the servant, not the master. Without a depth of understanding of this enabling role and the context in which technology serves, technology can be misguided and its developers can lose perspective. This presentation outlines a proposal made to the US President’s Office of Science and Technology for technology research for the next decade, which calls for new computational models and infrastructure to support the next generation of computing, collaborative computing. A major focus to reconsider the role of data in computing. This is only one view. Que sera, sera.

Speaker Biography

Dr. Michael L. Brodie is Sr. Technologist, GTE Technology Organization, Waltham, MA and Chief Scientist (SAP Program) at GTE Corporation. He works on large-scale strategic Information Technology (IT) challenges for GTE Corporation’s senior executives. His industrial and research focus is on large-scale information systems — their total life cycle, business and technical contexts, core technologies, and “integration” within in a large scale, operational telecommunications environment. Dr. Brodie has authored over 120 books, chapters, journal articles and conference papers. He has presented keynote talks, invited lectures and short courses on many topics in over twenty-five countries.
Keynote II: A Distributed Object Web-Publishing Environment using CORBA
Al Issa, Dir. of Software Development and Application Services, CNN Interactive

Abstract

This presentation describes the distributed object-centric CORBA based web-publishing environment used by CNN Interactive. Distributed Object technology has played a crucial role in the creation, management, distribution and re-purposing of news content. This case study overviews the CNN Interactive architecture, challenges and lessons learned on deploying these systems.

Company Background

Cable News Network’s (CNN), CNN Interactive, the world’s leader in on-line news and information delivery, is dedicated to providing 24-hour a day, up-to-the-minute access to news and information on the World Wide Web (http://cnn.com/). CNN Interactive delivers the most comprehensive U.S. and global news and event coverage available on the Internet today.

Speaker Biography

Al Issa is the director of software development and application services for CNN Interactive. He is responsible for software development and operations for the following CNN Web sites: CNN.com, CNNenEspanol.com, CNNemPortugues.com and AllPolitics.com. Issa oversees a team of 15 software developers and 20 Web staffers who design and implement key components of CNN Interactive content, as well as create software and operational procedures to support the constant updates and demands of a 24-hour online news operation. Issa also works closely with CNN Interactive’s editorial, business and marketing teams to develop new revenue opportunities for the online marketplace. Prior to joining CNN Interactive in September 1996, Issa oversaw a server software development team at SITA-Airlines Telecommunications Consortium and was software engineer at Bell Northern Research/Northern Telecom and Bell Laboratories. Issa is a native of Miami, Fl., and graduated with a Master’s degree in computer science from Illinois Institute of Technology in 1992. He received his bachelor’s degree in computer science from Florida International University in 1989.