Lecture Notes in Computer Science 6665

Commenced Publication in 1973
Founding and Former Series Editors:
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OpenMP in the Petascale Era

7th International Workshop on OpenMP, IWOMP 2011
Chicago, IL, USA, June 13-15, 2011
Proceedings

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ISSN 0302-9743 e-ISSN 1611-3349
ISBN 978-3-642-21486-8 e-ISBN 978-3-642-21487-5
DOI 10.1007/978-3-642-21487-5
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2011928504

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

LNCS Sublibrary: SL 2 – Programming and Software Engineering

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

OpenMP is a widely accepted, standard application programming interface (API) for high-level shared-memory parallel programming in Fortran, C, and C++. Since its introduction in 1997, OpenMP has gained support from most high-performance compiler and hardware vendors. Under the direction of the OpenMP Architecture Review Board (ARB), the OpenMP specification has evolved, including the recent release of the draft of Specification 3.1 for public comment. Active research in OpenMP compilers, runtime systems, tools, and environments drives its evolution, including new features such as tasking. OpenMP is both an important programming model for single multicore processors and as part of a hybrid programming model for massively parallel, distributed memory systems built from multicore or manycore processors. In fact, OpenMP offers important features that can improve the scalability of applications on the petascale systems now being installed (both the current "Peak" petascale systems and the sustained petascale systems, two of which are being installed in Illinois). This year's conference took its title from the important role that OpenMP has to play in the new era of petascale computing systems. The papers, each of which was rigorously reviewed by at least three experts in the field, cover everything from using OpenMP with applications, tools for more effective use of OpenMP, and extensions and implementation of OpenMP.

The community of OpenMP researchers and developers in academia and industry is united under cOMPunity (www.compunity.org). This organization has held workshops on OpenMP around the world since 1999: the European Workshop on OpenMP (EWOMP), the North American Workshop on OpenMP Applications and Tools (WOMPAT), and the Asian Workshop on OpenMP Experiences and Implementation (WOMPEI) attracted annual audiences from academia and industry. The International Workshop on OpenMP (IWOMP) consolidated these three workshop series into a single annual international event that rotates across the previous workshop sites. The first IWOMP meeting was held in 2005, in Eugene, Oregon, USA. Since then, meetings have been held each year, in Reims, France, Beijing, China, West Lafayette, USA, Dresden, Germany, and Tsukuba, Japan. Each workshop has drawn participants from research and industry throughout the world. IWOMP 2011 continued the series with technical papers, tutorials, and OpenMP status reports. In addition, IWOMP 2011 was collocated with the meetings of the OpenMP Architecture Review Board and Language Committee, providing a close connection between researchers and OpenMP standard. The first IWOMP workshop was organized under the auspices of cOMPunity. Since that workshop, the IWOMP Steering Committee has organized these events and guided development of the series. The IWOMP meetings have been successful in large part due to the generous support from numerous sponsors.

The cOMPunity website (www.compunity.org) provides access to many of the activities and resources of the OpenMP community. The IWOMP website (www.iwomp.org) provides information on the latest event. This book contains proceedings of IWOMP 2011. The workshop program included 13 technical papers, 2 keynote talks, and a tutorial on OpenMP.

March 2011

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