Proceedings of

WACCPD 2015: Second Workshop on Accelerator Programming using Directives

Monday, November 16, 2015



Held in conjunction with

SC15: The International Conference for High Performance Computing, Networking, Storage and Analysis

Austin, Texas, November 15-20, 2015









The Association for Computing Machinery, Inc. 2 Penn Plaza, Suite 701 New York, NY 10121-0701

ACM COPYRIGHT NOTICE. Copyright © 2015 by the Association for Computing Machinery, Inc.

Permission to make digital or hard copies of part or all of this work for
personal or classroom use is granted without fee provided that copies are not made or
distributed for profit or commercial advantage and that copies bear this notice and the
full citation on the first page. Copyrights for components of this work owned by others
than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to
republish, to post on servers, or to redistribute to lists, requires prior specific permission
and/or a fee. Request permissions from Publications Dept., ACM, Inc., fax +1 (212) 869-0481,
or permissions@acm.org.

For other copying of articles that carry a code at the bottom of the first or last page, copying is permitted provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, +1-978-750-8400, +1-978-750-4470 (fax).

ACM ISBN: 978-1-4503-4014-4

Contents

PAPER	TITLE OF THE PAPER	AUTHORS NAMES	EMAIL ADDRESS OF LEAD AUTHOR
1	SSMART: Smart Scheduling of Multi-Architecture Tasks on Heterogeneous Systems	Judit Planas:Barcelona Supercomputing Center // Universitat Politecnica de Cataluny; Rosa M. Badia: BSC; Eduard Ayguade: UPC (Technical University of Catalunya); Jesus Labarta:BSC	judit.planas@bsc.es
2	Accelerating the Multi-zone Scalar Pentadiagonal CFD Algorithm with OpenACC	Christopher Stone:Computational Science and Engineering, LLC; Bracy Elton:Engility Corporation	chris.stone@computati onal-science.com
3	Acceleratting an MPI Lattice Boltzmann Code using OpenACC	Stu Blair:U.S. Naval Academy; Carl Albing:U.S. Naval Academy; Alexander Grund:Technische Universität Dresden; Andreas Jocksch:Swiss National Computing Center (CSCS)	sblair@usna.edu
4	Experiences in extending Parallware to support OpenACC	Jacobo Loberias:Appentra Solutions; Manuel Arenaz:Appentra Solutions; Oscar Hernandez:ORNL	jacobo.lobeiras@appen tra.com
5	Exploring Dynamic Parallelism in OpenMP	Guray Ozen:Barcelona supercomputing center; Eduard Ayguade:Barcelona supercomputing center;Jesus Labarta: Barcelona supercomputing center	guray.ozen@bsc.es
6	Acceleration of the FINE/Turbo CFD Solver in a Heterogeneous Environment with OpenACC Directives	David Gutzwiller:Numeca USA; Ravi Srinivasan:Dresser- Rand; Alain Demeulenaere:Numeca	david.gutzwiller@num eca.com
7	A directive based hybrid Met Office NERC Cloud model	Nick Brown:EPCC; Angus Lepper:EPCC; Michele Weiland:EPCC; Adrian Hill:UK Met Office; Ben Shipway:UK Met Office, Chris Maynard:UK Met Office	nick.brown@ed.ac.uk

2015: Second Workshop on Accelerator Programming using Directives

Directive based programming models offer scientific applications a path onto HPC platforms without undue loss of portability or programmer productivity. Using directives, application developers can port their codes to the accelerators incrementally while minimizing code changes. Challenges remain because the directives models need to support a rapidly evolving array of hardware with diverse memory subsystems, which may or may not be unitied. The programming model will need to adapt to such developments, make improvements to raise its performance portability that will make accelerators as first-class systems for HPC. Such improvements are being continuously discussed with the standards committees such as OpenMP and OpenACC. This workshop airs to capture the assessment of the improved feature set, their implementation and experiences with their deployment in HPC applications. The workshop aims at bringing together the user and tools community to share their knowledge and experiences of using directives to program accelerators

WACCPD 2015 committee

Steering Committee:

Barbara Chapman (University of Houston, cOMPunity) Satoshi Matsuoka (Titech) Duncan Poole (OpenACC) Thomas Schulthess (CSCS) Oscar Hernandez (ORNL)

Program Chair and Co-Chairs

Sunita Chandrasekaran, University of Houston Fernanda Foertter, ORNL

Program Committee

Michael Heroux (SNL), Jeff Larkin (NVIDIA), James Beyer (NVIDIA), Mark Govette (NOAA), Ray Sheppard(Indiana U), Guido Juckeland (TU Dresden), Will Sawyer (CSCS), Michael Wolfe (NVIDIA/PGI), Thomas Schwinge (Mentor Graphics), John Mellor-Crummy (Rice), Henri Callandra (Total), Wayne Joubert (ORNL), David Bernthold (ORNL), Sameer Shende (U Oregon), Seyong Lee (ORNL), Henri Jin (NASA--Ames), Jeff Hammond (Intel Labs), Richard Barrett (SNL), Chunhua Liao (LLNL), Carl Ponder (NVIDIA), Si Hammond (Sandia NL), Michael Klemm (Intel), Christos Kartsaklis (ORNL), Makus Eisenbach (ORNL), Eric Stotzer (TI), Wei Ding (AMD)