

Binary translation and virtualization cluster

Koen De Bosschere

Jonas Maebe

Ghent University

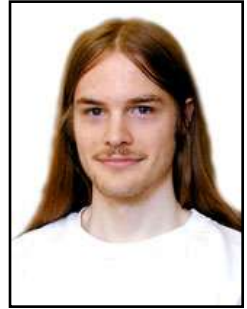
Kick-off Meeting

Göteborg, January 31, 2008

Program

- Who is who
- The past
- The future
- Presentations ...
- Conclusion – action points

Jonas Maebe



- Master in Computer Science 2002
- PhD in Computer Engineering 2007
 - Diota - Dynamic Instrumentation, Optimisation and Transformation of Applications
 - <http://www.elis.ugent.be/diota>
- Currently maintaining and extending Diablo
 - Diablo Is A Better Link-time Optimizer
 - <http://diablo.elis.ugent.be/>
- HiPEAC-BTV animator

Registered participants

Daniel Kaestner	absint
Philip Barnard	arc
Nathan Chong	arm
Sascha Uhrig	augsburg
Mladen Berekovic	braunschweig
Daniel Gracia-Perez	cea
Gilles Mouchard	cea
Yiannakis Sazeides	cyprus
Pedro Trancoso	cyprus
Daniel Jones	edinburgh
Nigel Topham	edinburgh

Registered participants

David Bernstein	ibm
Bilha Mendelson	ibm
Stylianos Mamagkakis	imec
Leonel Sousa	inesc-id
Joao Cardoso	inesc-id
Cupertino Miranda	inria
Albert Cohen	inria
Avi Mendelson	intel
Fabian Nowak	karlsruhe
Rainer Buchty	karlsruhe

Registered participants

Ian Watson	manchester
Mikel Lujan	manchester
Andy Nisbet	manchester
Jose manuel Garcia	murcia
Sandro Bartolini	siena
Marco Cornero	st
Erven Rohou	st
Shlomo Weiss	tel aviv

Registered participants

Koen De Bosschere	ugent
Jonas Maebe	ugent
Lieven Eeckhout	ugent
Bjorn De Sutter	ugent
Marisa Gil	upc
Carlos Villavieja	upc
Nacho Navarro	upc
Neil Audsley	york

Retro-acta BT

- HiPEAC I cluster on Whole System Optimization – UGent, UPC, IBM, Ed
- ~~FP6 STREP project OPTICORES 2005~~
- FP6 Sarc project – part of the compiler tool chain for the Sarc Architecture
- Several Users
- Dagstuhl Seminar on binary translation: 26-31 October 2008

Retro-acta V

- Few HiPEAC academic members have Java research tradition - .NET even less
- Increased industrial interest in virtualization
 - ST – CLI
 - JEOPARD project
 - XenSource
 - ...
- ACACES 2007 industrial workshop
- Braga Consultation Meeting

Computing Systems: next Call

The outcome of the 19 November 2007 consultation meeting on Computing Systems

- Computing Systems must offer ...
 - More **performance**
 - More **power-efficiency**
 - More **reliability**
- ... through breakthroughs in ...
 - **Parallelisation**
 - **Architectural Customisation**
 - **Virtualisation**
 - **Run-time optimisation**
 - **System modelling and analysis**
- ... addressing the special issues of ...
 - **Reconfigurable Computing**
 - **Supercomputing**
- ... and without forgetting technology impacts
 - e.g. **3D stacking**

Program

- Who is who
- The past
- **The future**
- Presentations ...
- Conclusion – action points

Cluster objectives

active cluster members

companies involved per cluster

publication output per cluster

joint papers between cluster members

submitted joint project proposals per cluster

members in PC's of conferences, editorial boards of journals

exchanges, visits between cluster members

organized activities: workshops, tutorials, seminars

invited talks, tutorials by cluster members

graduated PhDs per cluster

Cluster objectives

# active cluster members	37
# companies involved per cluster	6
# publication output per cluster	
# joint papers between cluster members	
# submitted joint project proposals per cluster	
# members in PC's of conferences, editorial boards of journals	
# exchanges, visits between cluster members	
# organized activities: workshops, tutorials, seminars	2
# invited talks, tutorials by cluster members	
# graduated PhDs per cluster	1

ACACES 2008

Virtualization Technologies

By Leedert Van Doorn, AMD, Austin, USA

Course objective: Provide the students with a deep understanding of current and future virtualization technologies, how they are implemented, and how they are used in today's products. The course will contain many quantitative examples and actual case studies. The student will also learn about the open (research) problems in virtualization.



Leendert van Doorn is a Senior Fellow at AMD where he runs the Software Technology Office. Before joining AMD he was a senior manager at IBM's T.J. Watson Research Center, where he managed the secure systems and security analysis departments. He received his Ph.D. from the Vrije Universiteit in Amsterdam where he worked on the design and implementation of microkernels. Nowadays his interests are in managed code, accelerated computing (AMD's name for heterogenous and homogenous manycore computing), security and virtualization. In his former job at IBM he worked on FIPS 140-2 level 4 physically secure coprocessors, trusted systems, and virtualization. He was actively involved in IBM's virtualization strategy, created and lead IBM's secure hypervisor and trusted virtual data center initiatives, and was on the board of directors for the Trusted Computing Group. Despite all these distractions, he continued to contribute code to the Xen open-source hypervisor, such as the integrated support code for AMD-V and Intel(r) VT-x. He is an adjunct professor at Rice university.

Lecture 1: Introduction to virtualization technologies

In this lecture I will discuss a taxonomy of virtualization models and technologies, and provide an understanding of what use cases are driving today's and tomorrow's markets.

Lecture 2: CPU virtualization technologies

In this lecture I will dive deeply into CPU virtualization technologies. This includes a detailed study of hardware virtualization support, memory management (shadow page tables and nested page tables), and interrupt management.

Lecture 3: I/O virtualization technologies

I/O is another key element of virtualization and I will have an in depth discussion about I/O virtualization in this lecture. This includes a detailed study of IOMMU's, PCI-sig IOV, and virtualized devices.

Lecture 4: Platform virtualization technologies

Virtualization touches many aspects of the platform and enables new use models. In this last lecture I will discuss some of technologies that enable them and how everything ties together. I will also address some of the future directions and open research questions.

organized activities: workshops, tutorials, seminars

- Virtualization Technologies @ ACACES
- Dagstuhl
- ???

An opportunity?

Principles and Practices of Programming in Java
PPPJ 2008 - Modena, Italy, Sep. 8-11 2008
Workshop and Tutorials - Call for Proposals
#####

The PPPJ 2008 organizing committee is soliciting proposals for workshops and tutorial sessions to be held in conjunction with the main programme. The purpose of PPPJ workshops and tutorials is to discuss emerging aspects of Java programming with students, researchers and practitioners. The aims of the sessions are to develop understanding, to exchange experiences, to build research communities and to help to characterize the direction of future developments.

The possible subjects to focus on include (non exhaustively) the following:

- * Optimization
- * VM Design
- * Java Verification
- * Aspect-Orientation
- * Java-specific metrics
- * Software Engineering with Java
- * Program Design and Implementation
- * Design Patterns through Java
- * Testing of Java Programs
- * Performance of Java Programs
- * Tools for Java Programming
- * Java-based MDD/MDA
- * Prototype generation in Java

- * Applications in science, engineering, and business
- * Novel Applications of Java
- * Domain-specific Frameworks
- * Java-based Tools
- * Java-based Enterprise Computing
- * Mobile Java
- * Practice and experience
- * Java and Financial Services
- * Java and the Manufacturing Industry
- * Teaching Java Programming
- * Teleteaching Applications
- * Teaching Methods

Workshop and tutorial sessions will be held in conjunction with the PPPJ 2008 conference. Tutorials should last 1,5 to 2 hours, workshops should last 2 to 4 hours. Workshop sessions may include a submission and review process of short papers (max 4 pages), and should include a discussion session. Tutorials should focus on a particular technique, software or methodology. Workshop papers will be published with the conference proceedings.

Workshop and tutorial proposals should be no longer than four pages, should describe the background and focus of the workshop, the background of the workshop organizing committee and the estimated number of participants. Proposals should also include a draft Call for Papers.

The organizers of PPPJ 2008 will provide a meeting room and it is currently intended to publish workshop proceedings along with the PPPJ proceedings in the ACM International Conference Proceedings series. All other issues related to proposed workshops will have to be planned and organized by the workshop organizing committee.

Workshop and Tutorials proposals should be sent by email to Matteo Risoldi and Priya Nagpurkar:

matteo.risoldi@cui.unige.ch

pnagpurkar@us.ibm.com

IMPORTANT DATES:

- * Submission of workshop and tutorial proposals: February 29
- * Notification of accepted proposals: March 7
- * Paper submissions for workshops: May 9th
- * Notification to paper authors: June 9th
- * Camera ready version: June 23rd

ACACES 2009

- Mendel Rosenblum, CTO VMWARE + U Stanford ?
- Others ?
-

Roadmap

- Marc Duranton

Preliminary list of questions:

The following questions are related to the domain of your cluster:

- What are the main problems/challenges you see in the next 5 years?
- What are the main problems/challenges you see in the next 5 to 10 years?
- What are the main problems/challenges you see after the next 10 years?

Preliminary list of questions:

For all of the challenges you enumerate, please give an assessment of:

- Who is working on that? (Country, university, industry, ...)
- Is there already any promising solutions? Which ones? Are they similar?
- What is the activity of Europe in that? Of the Hipec partners?
- What could be the impact if the challenges are not solved?
- What could be the impact if the challenges are solved?

Preliminary list of questions:

- Do you see other challenges in other domain that could impact (positively or negatively) your domain?
- Explain.
- What do you see as probable key evolutions in your domain in the next 5 years?
- In the next 5 to 10 years?
- Beyond 15 years?

(This is different from the first questions: current and probable evolution could ignore a problem/challenge !)

Are we missing something?

Presentations

- If possible, try also to focus on

publication output per cluster

joint papers between cluster members

submitted joint project proposals per cluster

members in PC's of conferences, editorial boards of journals

exchanges, visits between cluster members

organized activities: workshops, tutorials, seminars

invited talks, tutorials by cluster members

graduated PhDs per cluster

Conclusions – action points

- Workshop at PPPJ ?
- Dagstuhl ?
- Registering for the Summer School
- Thinking about the roadmap challenges
- Teacher for ACACES 2009
- More companies, members ?