8TH JLESC WORKSHOP

April 17th - 19th, 2018

UPC- Vertex building, Barcelona

Tuesday April 17th

Meeting room **Sala d'Actes**

8.30 am — Registration / Continental breakfast

9.00 am — **Opening**
Franck Cappello, Argonne National Laboratory (15')
William Gropp, NCSA (5')
Jesus Labarta, Barcelona Supercomputing Center (10')

Plenary Chair: Robert Speck (JSC)

9.30 am — **Using Short Precision in Numerical Computing**
Jack Dongarra (University of Tennessee and Oak Ridge National Lab)

10.00 am — Break

SALA 1 *VS208*

Session Chair: Franck Cappello (ANL)

Short talks

Performance

10.30 am — **Earth Sciences models and developments at BSC**
Mario Acosta and Miguel Castrillo (BSC)

10.40 am — **Memory and affinity aware placement on heterogeneous architectures**
François Tessier - ANL

10.50 am — **Designing Progress Metrics for Dynamic Management of HPC Applications**
Swann Perarnau, Argonne National Laboratory

11.00 am — **Non-Intrusive Job Performance-Monitoring with LLview Job-Reporting**
Wolfgang Frings (JSC)

11.10 am — **Round table**

12.30 pm — Lunch

SALA 2 *SALA D'ACTES*

Session Chair: Ruth Schöbel (JSC)

Short talks

APPS

10.30 am — **Optimization of Fault-Tolerance Strategies for Workflow Applications**
Yves Robert (Inria)

10.40 am — **Adaptive MPI: Dynamic Runtime Support for Pre-existing MPI Applications**
Sam White (UIUC)

10.50 am — **Energy efficient FPGAs through extremely low voltage**
Osman Unsal (BSC)

11.00 am — **Optimal Cooperative Checkpointing for Shared High-Performance Computing Platforms**
Thomas Herault (University of Tennessee, Knoxville)

11.10 am — **Approximating a Multi-grid solver**
Valentin Le Fèvre (ENS de Lyon)

11.20 am — **The New Sustained Petascale Performance Benchmark Suite for 2017**
Bill Kramer, NCSA

11.30 am — **Round table**

Lunch

Session Chair: Mitsuhisa Sato (RIKEN)

BOS

Climate

1.30 pm	**High Performance Computing for Earth System Models: Optimization and Profiling** *Mario Acosta and Miguel Castrillo (BSC)*	
1.50 pm	**Numerical weather/climate model for cost-performance using mixed precision floating point number** *Tsuyoshi Yamaura (Riken)*	
2.10 pm	**Advanced online diagnostics Earth System Models** *Olaf Stein (JSC)*	
2.30 pm	**Boosting atmospheric dust prediction with PyCOMPSs** *Javier Conejero (BSC)*	
2.50 pm	*Coffee break*	
3.20 pm	**Improving the throughput of Earth System Models using an asynchronous parallel I/O server** *Xavier Yepes (BSC)*	
3.40 pm	***Discussion BOS***	
5.00 pm	***Adjourn***	

Session Chair: Miwako Tsuji (RIKEN)

Project talks

Performance & APPS

1.30 pm	**Developer Tools for Porting and Tuning Parallel Applications on Extreme-Scale Parallel Systems** *Brian Wylie (JSC)*
1.50 pm	**Use of the Folding profiler to assist on data distribution for heterogeneous memory systems** *Antonio J. Peña, BSC*
2.10 pm	**Simplified Sustained System performance benchmark** *Miwako Tsuji (RIKEN)*
2.30 pm	**The ChASE library for large Hermitian eigenvalue problems** *Edoardo Di Napoli (JSC)*
2.50 pm	*Coffee break*

Session Chair: Edoardo di Napoli (JSC)

Project and Short talks

Numerical

3.20 pm	**Performance benchmark of standard eigensolver on KNL systems** *Toshiyuki Imamura (RIKEN AICS)*
3.40 pm	**Fast Integrators for Scalable Quantum Molecular Dynamics** *André Schleife, UIUC*
3.50 pm	**Source Transformation Algorithmic Differentiation of Memory Allocation and Pointer Manipulation** *Sri Hari Krishna Narayanan (Argonne)*
4.00 pm	**A node-aware approach to reducing communication in sparse matrix operations** *Amanda Bienz*
4.10 pm	**PAPI: Counting outside the box** *Anthony Danalis (ICL, University of Tennessee)*
4.20 pm	**Round table**
5.00 pm	***Adjourn***

8TH JLESC WORKSHOP

April 16th - 19th, 2018

UPC- Vertex building, Barcelona

Wednesday April 18th

Meeting room Sala d'Actes

8.30 am — Continental breakfast

Plenary Chair: Bernd Mohr (JSC)

9.00 am — **Perspectives on achieving Exascale: a View from Europe**
Mateo Valero, Barcelona Supercomputing Center

9.30 am — **International (USA, Europe and Japan) survey for supercomputer users**
Emmanuel Jeannot (Inria), George Bolsica (UTK), Atsushi Hori (Riken), Takahiro Ogura (RIKEN)

9.45 am — Break

SALA 1 VS208

Session Chair: Gabriel Antoniu (INRIA)
Short talks

I/O

10.00 am — **Sizing Burst-Buffers with respect to applications**
Guillaume Aupy, Inria

10.10 am — **TINS: A Task-Based Dynamic Helper Core Strategy for In Situ Analytics**
Estelle Dirand, INRIA

10.20 am — **Towards a malleable storage system**
Nathanaël Cheriere (Inria)

10.30 am — **CADMUS - Composite and ADaptive Media Unification System**
Georgios Koloventzos - Barcelona Supercomputing Center

10.40 am — **Dynamic reconfiguration of the I/O forwarding layer of HPC architectures**
Francieli Zanon Boito, INRIA

10.50 am — **Round table**

12.00 pm — *Lunch*

Session Chair: Andreas Lintermann (JSC)
BOS

CFD

1.00 pm — **Towards CAD/CFD integration for efficient analysis & design**
Regis Duvigneau

1.20 pm — **BOS-CFD multi-code dynamic coupling in HPC systems**
Juan Carlos Cajas García, (BSC)

SALA 2 SALA D'ACTES

Session Chair: Amanda Bienz (UIUC)
Short talks

Numerical & Performance

10.00 am — **Optimizing Alya for complex geometry LES towards the exascale**
Herbert Owen - BSC

10.10 am — **Towards an optimal use of numerical precision in Earth Science models: the case of NEMO**
Oriol Tintó (Barcelona Supercomputing Center)

10.20 am — **Mesh (Re)partitioning based on SFC**
Ricard Borrell (Barcelona Supercomputing Center)

10.30 am — **Automatic differentiation for Scientific Machine Learning Applications**
Sri Hari Krishna Narayanan (Argonne National Laboratory)

10.40 am — **Analysis of Load imbalance in Alya**
Arnaud Legrand (Inria POLARIS)

10.50 am — **Clowder: Open Source Data Management for Long Tail Data**
Indira Guiterrez, NCSA

11.00 am — **High performance architectures for genomics applications**
Miquel Moreto, BSC

11.10 am — **Round table**

12.00 pm — *Lunch*

Session Chair: Matthieu Dorier (ANL)
Project talks

I/O

1.00 pm — **Progress on Automatic I/O Scheduling algorithm selection**
Francieli Zanon (Inria) / Ramon Nou (BSC)

1.20 pm — **Integration of Decaf and PyCOMPSs**
Jorge Ejarque (BSC)

1.40 pm	**BOS-CFD an accerelation of industrial CFD**	1.40 pm	**I/O optimization and memory portioning for large-scale applications**
	Keiji Onishi (RIKEN AICS)		*Emmanuel Jeannot (Inria)*
2.00 pm	**BOS-CFD - Zonal Flow Solver (ZFS): Capabilities and Future Directions**	2.00 pm	**An Ultra-Scalable Distributed Logging Library for HPC Systems**
	Andreas Lintermann, JSC		*Pierre Matri (UPM and Inria)*
2.20 pm	**BOS-CFD Large-eddy simulation of massively separated aircraft wake**	2.20 pm	**Code Coupling Capabilities Enabled by Novel Workflow Semantics**
	Oriol Lehmkuhl, BSC		*Justin M Wozniak (ANL)?*
2.40 pm	*Coffee break*	2.40 pm	*Coffee break*
			Session Chair: Cristian Pérez (Inria)
			Short talks
			Programming
3.00 pm	***Discussion BOS***	3.00 pm	**System-independent global scheduling algorithms with MOGSlib**
			Laercio Lima Pilla - INRIA
4.20 pm	***Adjourn***	3.10 pm	**OmpSs offload: running OmpSs code from anywhere**
			Marc Marí Barceló (Barcelona Supercomputing Center)
		3.20 pm	**Interoperability between MPI and the OmpSs task-based programming model**
			Kevin Sala Penadés (Barcelona Supercomputing Center)
		3.30 pm	**Collaboration Opportunities with the Accelerators and Communications for HPC Team at BSC**
			Antonio J. Peña (BSC)
		3.40 pm	**Towards Standard Load Balancer Abstractions**
			Vincent Reverdy, UIUC
		3.50 pm	**Termination detection: Are we done yet ?**
			George Bosilca (University of Tennessee, USA)
		4.00 pm	**CharmPy: A Python Interface to Parallel Programming with Charm++**
			Sam White (UIUC)
		4.10 pm	**MPICH Optimization with Process-in-Process and Dynamic Execution Environment**
			Atsushi Hori (RIKEN)
		4.20 pm	**Design and Preliminary Evaluation of XMP2.0 task model using Argobots**
			Jinpil Lee (RIKEN)
		4.30 pm	**Round table**
		5.30 pm	***Adjourn***

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Thursday April 19th

Meeting room Sala d'Actes

8.30 am Continental breakfast

Plenary Chair: Jesus Labarta (BSC)

9.00 am **FPGA-based Data-Flow Computing for Tsunami Simulation**

Kentaro Sano, Team Leader of Processor Research Team, Advanced Institute of Computer Science, Riken

SALA 1	*VS208*		*SALA 2*	*SALA D'ACTES*
			Session Chair:	Rosa M. Badia (BSC)
			Project talks	
			Architecture & Programming	
		9.30 am	**Sharing and extension of OmpSs2 runtime for XMP 2.0 PGAS task model**	
			Mitshuhisa Sato (Riken) / Josep M. Perez (BSC)	
		9.50 am	**Evaluating high-level programming models for FPGA platforms**	
			Carlos Alvarez (BSC) and Kazutomo Yoshii (ANL)	
10.10 am	*Coffee break*	10.10 am	*Coffee break*	
Session Chair:	Toni Cortés (BSC)	10.30 am	**MPICH over Unimem**	
			Kenneth Raffenetti, ANL / Kyunghun Kim (BSC)	
Short talks				
I/O				
10.40 am	**Large-scale Data (Re)Sampling: Recent Experiences and State-of-the-Practice Shortcomings**			
	Rob Sisneros (NCSA)			
10.50 am	**I/O management for task based programming models: The OmpSs use case**	10.50 am	**Chameleon: a Testbed for Systems Research**	
	Aleix Roca Nonell (BSC)		*Kate Keahey, ANL*	
11.00 am	**HPC-Big Data convergence at the processing level: a vision**			
	Gabriel Antoniu			
11.10 am	**Partitioning strategies for in-situ analysis in HPC applications**	11.10 am	**Advancing Chameleon and Grid'5000 testbeds**	
	Valentin HONORE (Université de Bordeaux, INRIA)		*Christian Perez (Inria) (by default)*	
11.20 am	**Mobject: Composing HPC Micro-Services to Build a Distributed Object Store**			
	Matthieu Dorier (ANL)			

			Session Chair: Bill Kramer (NCSA) **Project and short talks**
			Resilience
11.30 am	**Round table**	11.30 am	**Searching for SDC in production systems** *Leonardo Bautista-Gomez (BSC)*
		11.50 am	**Checkpoint/Restart of/from lossy state** *Franck Capello (ANL)*
		12.10 pm	**Beyond resilience: A view on the broader use cases of checkpointing in HPC** *Nicolae Bogdan*
		12.20 pm	**Multigrid and fault-tolerance** *Mirco Altenbernd (JSC, University of Stuttgart)*
		12.30 pm	**Two-Levels Selective Hardening for HPC Applications** *Paolo Rech (UFRGS, Brasil)*
12.40 pm	*Lunch*	12.40 pm	*Lunch*
Session Chair: Ivo Kabadshow (JSC) **BOS**		Session Chair: Franck Cappello **BOS**	
C++		**ML/DL**	
1.20 pm	**Cutting edge C++ features in a cutting edge HPC ecosystem** *Ivo Kabadshow (JSC)*	1.20 pm	**The HPC-BigData Project Lab at INRIA** *Bruno Raffin (INRIA)*
1.40 pm	**Scalability Enhancements to FMM for Molecular Dynamics Simulations** *Laura Morgenstern, JSC*	1.30 pm	**Deep Learning with Python** *Morris Riedel (JSC)*
2.00 pm	**C++ priority scheduling at compile-time** *David Haensel, JSC*	1.50 pm	**System for Deep Learning** *Volodymyr Kindratenko, NCSA*
2.20 pm	**Parallelism in Modern C++** *Hal Finkel (ANL)*	2.10 pm	**Balancing Machine Learning Algorithms on HPC Architectures** *Aaron Saxton (NCSA)*
2.40 pm	**Efficient vectorization in a C++ world** *Ivo Kabadshow, JSC*	2.30 pm	*George Thomas (ICL)*
3.00 pm	***Coffee break & DISCUSSION BOS***	2.50 pm	**A language for describing simulation models for AI training environments** *Hiroya Matsuba (RIKEN)*
		3.10 pm	***Coffee break & DISCUSSION BOS***
3.35 pm	*Closing Plenary Session*		
3.45 pm	*End of Workshop*		