

ECMWF HPC Workshop : Realizing Tera-Computing

Table of Contents

<u>Tenth ECMWF Workshop on the Use of High Performance Computing in Meteorology</u>	1
<u>Realizing TeraComputing</u>	1
<u>Programme (updated 1 November 2002)</u>	3
<u>Monday, 4 November</u>	3
<u>Session 1</u>	3
<u>Session 2</u>	3
<u>Session 3</u>	3
<u>Session 4</u>	4
<u>Tuesday, 5 November</u>	5
<u>Session 5</u>	5
<u>Session 6</u>	5
<u>Session 7</u>	5
<u>Session 8</u>	5
<u>Wednesday, 6 November</u>	6
<u>RAPS Workshop</u>	7
<u>Session 9</u>	7
<u>Session 10</u>	7
<u>Session 11</u>	7
<u>Session 12</u>	7
<u>Thursday, 7 November</u>	7
<u>Session 13</u>	8
<u>Session 14</u>	9
<u>Session 15</u>	9
<u>Session 16</u>	9
<u>Friday, 8 November</u>	9
<u>Session 5</u>	9
<u>Programme : Tuesday, 5 November</u>	10
<u>Programme : Wednesday, 6 November</u>	11
<u>Programme : Thursday, 7 November</u>	11
<u>Programme : Friday, 8 November</u>	11

Tenth ECMWF Workshop on the Use of High Performance Computing in Meteorology

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Realizing TeraComputing

ECMWF, Reading, England, 4–8 November 2002

Every second year the European Centre for Medium-Range Weather Forecasts (ECMWF) hosts a workshop on the use of high performance computing in meteorology. In 2002 we will hold our 10th workshop in this well established series, from 4 to 8 November. The emphasis of this workshop will be again on 'TeraComputing', that is, achieving sustained teraflop performance in a production environment.

Our aim is to provide a venue where

- users from our Member States and around the world can report on their experience and achievements in the field of high performance computing during the last two years; plans for the future and requirements for computing power will also be presented;
- vendors of supercomputers will have the opportunity to talk to managers and end users of meteorological computer centres about their current and future products ;
- meteorological scientists can present their achievements in the development of parallel computing techniques and algorithms, and can exchange ideas on the use of supercomputers in future research;
- computer scientists can give an update on their efforts in providing tools which will help users to exploit the power of supercomputers in the field of meteorology;
- the challenges of creating a computer centre infrastructure for 'TeraComputing' can be discussed.

The workshop will consist of a limited number of presentations from invited speakers, plus a series of 20 minutes contributions. As in previous workshops, the morning of the final day will be reserved for an open discussion session. This workshop will start on Monday 4th November at 9:30am and close on Friday 8th at 12:00 noon. It is planned to publish the proceedings of the workshop.

Attendance at the workshop is by invitation and will be limited to around 100 persons. If you are interested, please contact by post, fax or e-mail:

Norbert Kreitz
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ECMWF HPC Workshop : Realizing Tera-Computing

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- [Programme](#)

11.10.2002

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Monday, 4 November		
08.30	Registration & Coffee	
09.30	Welcome & Opening	<ul style="list-style-type: none"> • D. Burrige, Director • W. Zwiefelhofer, Head, Computer Division
Session 1		
09.45	Ensemble prediction of weather and climate: A risky business.	<ul style="list-style-type: none"> • Tim Palmer, ECMWF
10:30	COFFEE	
Session 2		
11.00	Accelerating scientific discovery through computation.	<ul style="list-style-type: none"> • Bill Kramer, NERSC
11.45	Vector returns: A new supercomputer for the UK Met Office.	<ul style="list-style-type: none"> • Paul Burton, UK Met Office
12.05	Comparison of ECHAM5 performance on vector- and cache-based architectures.	<ul style="list-style-type: none"> • Luis Kornblueh, Max Planck Institute for Meteorology
12:30	LUNCH	
Session 3		
14.00	Operating system to support the ultra-parallel computing system – The operating system for the Earth Simulator.	<ul style="list-style-type: none"> • Takashi Yanagawa, NEC
14.30	Vector parallel programming and performance of a spectral atmospheric model on the earth simulator.	<ul style="list-style-type: none"> • Satoru Shingu, Earth Simulator Center
14.50	10 km mesh global atmospheric simulation.	<ul style="list-style-type: none"> • Wataru Ohfuchi, Earth Simulator Center
15.10		

	Development of parallel ocean general circulation models on Earth Simulator.	<ul style="list-style-type: none"> • Yukio Tanaka, Frontier Research System for Global Change
15:30	COFFEE	
Session 4		
16.00	4D-Var global ocean data assimilation system on Earth Simulator.	<ul style="list-style-type: none"> • Nozomi Sugiura, Frontier Research System for Global Change
16.20	The design of the Earth System Modelling Framework (ESMF).	<ul style="list-style-type: none"> • Christopher Hill, Massachusetts Institute of Technology
16.45	Implementation of the IFS on a highly parallel scalar system	<ul style="list-style-type: none"> • Mats Hamrud, Sami Saarinen, Deborah Salmond, ECMWF
17.30	Performance and scalability of atmospheric models on Linux systems	<ul style="list-style-type: none"> • Steve Lowder, Dept. of the Navy/NRL
17:55	CLOSE	
18:00	COCKTAILS	

Programme : Tuesday, 5 November

Tuesday, 5 November		
Session 5		
09.30	Primepower HPC2500: Fujitsu's high performance and highly scalable system.	<ul style="list-style-type: none"> • Nobuo Uchida, Fujitsu
10.00	HP's high performance computing strategy.	<ul style="list-style-type: none"> • Adrian Hillcoat, HP
10:30	COFFEE	
Session 6		
11.00	Potholes on the way to PetaFLOPS.	<ul style="list-style-type: none"> • Jamshed Mirza, IBM
11.30	The Cray X1 and product roadmap	<ul style="list-style-type: none"> • Steve Scott, Cray
12:00	HPC technical update.	<ul style="list-style-type: none"> • Dave Parry, SGI
12:20	The use of shared memory in climate, weather and ocean applications.	<ul style="list-style-type: none"> • Ilene Carpenter, SGI
12:40	LUNCH	
Session 7		
14.00	The Earth System Grid.	<ul style="list-style-type: none"> • Don Middleton, NCAR
14.45	Climate modelling infrastructure requirements: A retrospective look at PCM and a preview of CCSM2 requirements.	<ul style="list-style-type: none"> • Vincent Wayland, NCAR
15.10	The NOAA Operational Model Archive and Distribution system (NOMADS).	<ul style="list-style-type: none"> • Glenn Rutledge, National Climatic Data Center
15:30	COFFEE	

Session 8		
16.00	Data ingest and product distribution for TeraComputing: A scalable, flexible e-business architecture	<ul style="list-style-type: none"> • Bruce Gritton, FNMOC
16.20	Distributed storage nodes: An architecture to support teracomputing data handling.	<ul style="list-style-type: none"> • Nigel Dear, Legato Systems
16.40	Experiments with NCEP's spectral model	<ul style="list-style-type: none"> • Joe Sela, NCEP
17.00	I/O optimisation in NCEP GFS spectral model	<ul style="list-style-type: none"> • George Vandenberghe, IBM/NCEP
17:20	CLOSE	

Programme : Wednesday, 6 November

Wednesday, 6 November		
RAPS Workshop		
Session 9		
09:30	Welcome by local host	<ul style="list-style-type: none"> • W. Zwiefelhofer, ECMWF
09:40	Status of RAPS.	<ul style="list-style-type: none"> • Karl Solchenbach, Pallas
09:50	Early experience on the ECMWF IBM p690 clusters.	<ul style="list-style-type: none"> • George Mozdzyński, ECMWF
10:10	New METEO–FRANCE RAPS benchmarks.	<ul style="list-style-type: none"> • Denis Paradis, METEO–FRANCE
10:30	COFFEE	
Session 10		
11:00	ENES and PRISM: European approaches to earth system modelling.	<ul style="list-style-type: none"> • Reinhard Budich, Max Planck Institute for Meteorology
11:30	Grid computing for climate research applications	<ul style="list-style-type: none"> • Karl Solchenbach, Pallas
11:50	Adapting to OGSA: Evolution of revolution?	<ul style="list-style-type: none"> • David Snelling, Fujitsu
12:10	Implementation of data mining techniques for meteorological applications	<ul style="list-style-type: none"> • Antonio Cofino, University of Cantabria
12:30	LUNCH	
Session 11		
14:00	An integrated e–science environment for environmental science.	<ul style="list-style-type: none"> • Kerstin Kleese–van Dam, CLRC–Daresbury

		Laboratory
14:25	A HPC system architecture for earth system modelling.	<ul style="list-style-type: none"> • Wolfgang Sell, DKRZ
14:45	Medium-range goals for short-range numerical weather prediction.	<ul style="list-style-type: none"> • Ulrich Schättler, Deutscher Wetterdienst
15:05	Clusters as alternative for small to medium size weather services.	<ul style="list-style-type: none"> • Jure Jerman, Environmental Agency of Slovenia
15:30	COFFEE	
Session 12		
16:00	Towards the flexible composition and deployment of coupled models.	<ul style="list-style-type: none"> • Rupert Ford, Manchester University
16:20	Performance of Meteo applications on NEC supercomputers.	<ul style="list-style-type: none"> • Jörg Stadler, NEC
16:40	Hardware vendors' presentations	
17:00	From MegaFlops to TeraFlops	<ul style="list-style-type: none"> • Geerd-R. Hoffmann, Deutscher Wetterdienst
17:45	Meeting of RAPS Consortium	
18:00	WORKSHOP DINNER	

Programme : Thursday, 7 November

Thursday, 7 November		
Session 13		
09:30	ACTS – A collection of high performance software tools for scientific computing.	<ul style="list-style-type: none"> • Tony Drummond, LBNL–NERSC
09:50	MPH: A library for distributed multi–component environment.	<ul style="list-style-type: none"> • Chris Ding, Lawrence Berkeley National Laboratory
10:10	The scalable modelling system: New developments and lessons learned from performance optimisations.	<ul style="list-style-type: none"> • Daniel Schaffer, NOAA/FLS
10:30	COFFEE	
Session 14		
11:00	FMS: The GFDL flexible modelling system.	<ul style="list-style-type: none"> • Venkatramani Balaji, SGI/GFDL
11:25	The impact of SMP size on nearest neighbour message passing performance on the IBM POWER4 cluster environment.	<ul style="list-style-type: none"> • Jim Tuccillo, IBM
11:45	Scalability and performance of MOM: High resolution simulations of the Atlantic circulation.	<ul style="list-style-type: none"> • René Redler, NEC
12:05	3D Eddy–resolved ecosystem modelling in the Irish Sea.	<ul style="list-style-type: none"> • Mike Ashworth, CLRC–Daresbury Laboratory
12:30	LUNCH	
Session 15		
14:00	Self–adaptive parallel FE–models: Coupling an OpenMP mesh generator with MPI–solvers	<ul style="list-style-type: none"> • Stephan Fickenhau, Natalja Rakowsky, Alfred–Wegener–Institute
14.30	Optimisation of the IFS for the IBM p690	<ul style="list-style-type: none"> • John Hague, IBM
14.50	Performance of a coupled ocean–atmosphere	

	model on the IBM SP4	<ul style="list-style-type: none"> • Steven Cocke, Florida State University
15.10	Parallelisation of HLAFS model following an analytical model	<ul style="list-style-type: none"> • Zhengui Zhu, China Meteorological Administration
15:30	COFFEE	
Session 16		
16:00	Parallel assimilation of satellite observations	<ul style="list-style-type: none"> • Tuomo Kauranne, Lappeerante University of Technology
16:25	Technical development for the management of a NWP routine system	<ul style="list-style-type: none"> • Eizi Toyoda, Japan Meteorological Agency
16.45	Australian Bureau of Meteorology – Implications of teraflop computation for regional forecasting	<ul style="list-style-type: none"> • Leslie Logan, Bureau of Meteorology
17.05	Computational environment for air quality model in Texas	<ul style="list-style-type: none"> • Barbara Chapman, University of Houston
17:30	CLOSE	

Programme : Friday, 8 November

Friday, 8 November	
Session 5	
09:30	Panel on experience on using HPC in meteorology. Chairman: Walter Zwifelhofer
10:30	COFFEE
11:00	Panel discussion (continued)
12:00	CONCLUSION

01.11.2002

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