

SPECIAL PROJECT INTERIM REPORT

Interim Reports should be 2 to 10 pages in length, depending on importance of the project. All the following mandatory information needs to be provided.

Reporting year 2006

Project Title: PALM
Universal software for data assimilation

Computer Project Account: SPFRPALM

Principal Investigator(s): MOREL Thierry

Affiliation: CERFACS

Name of ECMWF scientist(s) collaborating to the project
(if applicable)

Start date of the project: 1997

Expected end date: Not determined

Computer resources allocated/used for the current year and the previous one (if applicable)

Please answer for all project resources

		Previous year		Current year	
		Allocated	Used	Allocated	Used
High Performance Computing Facility	(units)	5000		5000	
Data storage capacity	(Gbytes)	180		180	

Summary of project objectives

(10 lines max)

The PALM software aims to implement a general tool allowing to easily integrate high performance computing applications in a flexible and extensible way. This dynamic coupler has originally been designed for oceanographic data assimilation algorithms, but its application domain extends to every kind of scientific applications.

In the framework of PALM, applications are split in elementary components that can exchange data. The main features of PALM are the dynamic launching of the coupled components, the full independence of the components from the application algorithm, the parallel data exchanges with redistribution and the separation of the physics from the algebraic manipulations performed by the PALM algebraic toolbox.

Summary of problems encountered (if any)

(20 lines max)

PALM_MP based on the MPMD concept. This one is based on MPI2, which provides communications between independent processes. On the contrary to the MPI1 standard, the MPI2 one allows a better memory management and leads a higher and clearer independence between sources which have to be coupled. MPI2 is now available on the most common platforms.

The principal problem encountered on the ECMWF IBM was the non availability of the MPI2 standard on native implementation of MPI. This problem was solved while using the LAMMPI implementation.

Summary of results of the current year (from July of previous year to June of current year)

The main release of the PALM software is called PALM_MP. The PALM software are provided with both an installation and a user guide in order to facilitate the installation and the use of PALM as well as a tutorial which gradually introduces the concepts, functionalities and use of the PALM software. Moreover, three days training sessions are regularly organized and a support is available for users.

This year, the main activity of the PALM team was the development of the dynamic objects and new possibility to execute the units in the driver process. The dynamic objects allow the user to runtime redefine the size of data exchanged by the components. The target objects can inherit of the source objects properties. The capacity of the PALM driver to run units allows users to save a process in the applications.

The parallel algebra toolbox with geophysical interpolations is now complete. The latest version PALM_MP_2_3_0 has been successful installed and tested on the ECMWF IBM.

The PALM users' community is now spurred to use the PALM_MP release instead of PALM_RESEARCH. Despite this last point, new features can be implemented on request for PALM_RESEARCH.

For more information about the PALM software, please refer to the web site www.cerfacs.fr/~palm

List of publications/reports from the project with complete references

Thierry Morel, Samuel Buis : Les espaces dynamiques dans PALM_MP, Technical Report TR/CMGC/06/01, CERFACS, Toulouse, France, January 2006

Thierry Morel, Samuel Buis : Utilisation du coupleur dynamique PALM_MP 2.2.0, Technical Report TR/CMGC/05/112, CERFACS, Toulouse, France, April 2005 (Available on the web site www.cerfacs.fr/~palm)

Summary of plans for the continuation of the project

(10 lines max)

Some functionalities as parallel IO connected to the PALM_Put/Get functions will be developed at the end of 2006.