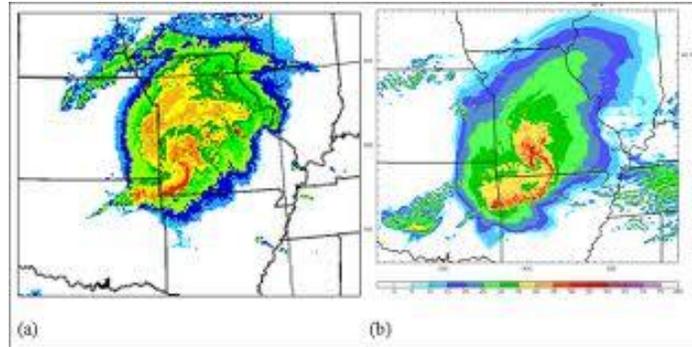


GENERAL INFORMATION ABOUT WRF

WRF corresponds to Weather Research and Forecasting Model

Description

The WRF model is a weather prediction system designed to serve both operational forecasting and atmospheric research needs. The system has a software architecture that allows computational parallelism and system extensibility. WRF is suitable for a high-end Applications across scales ranging from meters to thousands of kilometers.



Web site to download

http://www.mmm.ucar.edu/wrf/users/download/get_source.html

OBJECTIVE

The main idea is to take advantage to the WRF application, to get important data to analyze atmospheric and weather topics in Ecuador.

FEATURES OF WRF

The tasks performed by the application are substantially parallel and the CPU exchanging data with a protocol called MPI. The application makes heavy use mostly CPU. It is interactive and batch as it interacts with the user in the beginning and then sets the entries with a batch process.

The application currently works in a local cluster with 8 cores. As for the storage mechanisms are used Flat Files with extension .nc. All software packages are involved to run more than 20 MB

The typical time of CPU required for execution from one to two days. This, for the first tests. The program runs in the range of weeks to "real" data.

The expected number of tasks running during the execution of each job requires approximately 1 TB of local temporary disk space. But the permanent disk capacity needed is 10 TB (with this, it is possible to permanently store the output of execution).

The amount of RAM recommended to compile the application is 1024 MB.

ADDITIONAL DETAILS

WRF is installed on Linux / Unix (making tests on distributions like Ubuntu and Scientific Linux). The compilers used by this application are gcc, g + +, gfortran. The libraries used are NetCDF, libpng, jasper.

But the most important package is NetCDF¹ library.

The WRF model has been successfully ported to various Unix-based machines. Below is a list of supported combinations of hardware and software for WRF:

Vendedor	Hardware	OS	Compiler
Cray	X1	UniCOS	vendor
Cray	AMD	Linux	PGI
IBM	Power Series	AIX	vendor
IBM	Power Series	Linux	vendor
SGI	IA64 / Opteron	Linux	Intel Intel / PGI /
COTS*	IA32	Linux	gfortran / g95 / PathScale Intel / PGI /
COTS	IA64 / Opteron	Linux	gfortran / PathScale
Mac	Power Series	Darwin	xlf / g95 / PGI / Intel g95 / PGI / Intel
Mac	Intel	Darwin	

¹ NetCDF is a library for file management scientists, most commonly used to store atmospheric data.

NEC	NEC	Linux	vendor
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WRF can be compiled and executed on a machine with a single processor on a computer with shared memory (in this case using OpenMP API), a machine with distributed memory (MPI libraries are used), or on a distributed cluster (used both OpenMP and MPI).

REQUIREMENTS OF COMPILERS AND LANGUAGES TO SCRIPTS

Most of the WRF model and WPS is written in Fortran (Fortran 90). The MPI is written in C. WPS makes direct calls to the MPI library for message passing distributed memory. The WRF build mechanism (compilation) uses some scripts like: Perl, cshell cShell and Bourne Shell. Processing utilities in Unix text files that used are: make, m4, sed and awk.

REQUIRED LIBRARIES

The only library needed at all times is the package of Unidata NetCDF.

To run WRF using distributed memory requires a version of MPI: mpich, MPI-1 or MPI-2.

To use GRIB2 are needed libraries: zlib, jpeg and jasper.