

The world's biggest Linux database stores climate data

Record database at the German Climate Computing Centre's World Data Centre for Climate

Hamburg, November 2005. The World Data Centre for Climate (WDCC) and the German Climate Computing Centre (DKRZ) in Hamburg run the largest database in the world under the free Linux operating system. This is confirmed in the international ranking list of the world's largest databases published by the Winter Corporation in September. The WDCC database at the DKRZ has an inconceivable volume of almost 220 terabytes and is about double the size of the database of a well know search engine.

The World Data Centre for Climate (WDCC) of the International Council for Science (ICSU) is operated by the Model and Data Group at the Max Planck Institute for Meteorology (M&D/MPI-M) and the German Climate Computing Centre (DKRZ). The WDCC's database contains the latest climate research data on the state of the climate and anticipated climatic changes. 115 terabytes of storage are exclusively dedicated to IPCC simulation data for the new report of the United Nations' Intergovernmental Panel on Climate Change or IPCC, which is due to be published in 2007. This corresponds to around 24,500 DVDs.

"Climate research experts generate vast amounts of data in their complex simulations. The research findings can only be processed if the data can be accessed quickly and efficiently at all times. All computations are stored to enable subsequent comparisons. That's why the database is designed for vast data growth up to petabyte level," explained Dr. Michael Lautenschlager of the Max Planck Institute's Model & Data Group.

Technical information about the database

NEC installed the database system at the DKRZ three years ago in conjunction with a 1.5 teraflop NEC SX-6 series vector supercomputer. The government funded the vector supercomputer with around € 35 million euros and it is the fastest supercomputer for climate research in Europe. It can perform up to 1.5 billion computing operations per second and stores the computation results to hard disks at a speed of up to 450 megabytes per second.

The DKRZ has hard disks with a total capacity of 100 terabytes. Magnetic tapes libraries, with a total capacity of over 6 petabytes, are used to satisfy additional storage requirements. Several fast NEC TX7 data servers with Intel Itanium2 processors handle post processing, storage management and run the database system. They always know precisely which data are stored on which hard disks and tapes. The modelling results are stored in an Oracle relational database

and researchers from all around the world have access to them for further study. The total system, consisting of supercomputer and memory, covers 750 square metres of space at the Hamburg Geomatikum.

The complete list of the world's largest databases can be found at:

http://www.wintercorp.com/VLDB/2005_TopTen_Survey/2005TopTenWinners.pdf

Internet links

WDC Climate: www.wdc-climate.de

Data and information about IPCC AR4: ipcc.wdc-climate.de

About Model & Data

The Model & Data (M&D) Group at the Max Planck Institute for Meteorology is a service group for German and European climate research that is funded by the German Ministry for Education and Research. Its activities comprise the development and operation of a model and data infrastructure for Earth system research. One important aspect of this infrastructure is the World Data Centre for Climate, and over half a million data sets have already been downloaded from it this year.

For additional information, please visit the websites at <http://www.mad.zmaw.de> and <http://www.mpimet.mpg.de>.

About the DKRZ

The German Climate Computing Centre (DKRZ) was established in 1987 as a central service provider to German climate researchers in order to help them deal with increasingly significant issues such as the future development of the Earth's climate and the ensuing consequences for the environment and mankind.

The DKRZ operates state-of-the-art supercomputers and data servers, and provides the associated services. It is therefore an essential cornerstone of top level Earth system and climate research in Germany.

For additional information, please visit the website at <http://www.dkrz.de/>

The DKRZ receives financial support from the German Ministry for Education and Research.

The shareholders of DKRZ GmbH are the Max Planck Society, the University of Hamburg, the Alfred Wegener Institute for Polar and Marine Research and the GKSS Research Centre in Geesthacht.