NetCDF

NetCDF (network Common Data Form) is a set of software libraries and machine-independent data formats that support the creation, access, and sharing of array-oriented scientific data. For twenty years, the netCDF format and libraries have been developed and supported by Unidata. In 2008, the netCDF-4.0 release introduced new performance features, and an enhanced data model. The 4.1.1 release in 2010 added remote access features. Backward code and data compatibility has been maintained.

Getting Started

On many systems netCDF is available from package repositories (ex. yum install netcdf). Extensive documentation, training materials, and example code are available at the Unidata website: www.unidata.ucar.edu.

Many third-party tools support netCDF data.

Data Compression

Built-in data compression allows data variables to be compressed/uncompressed on the fly with the gzip algorithm. Uncompressing the data happens automatically, and is transparent to the reader.

Parallel I/O

For high performance computing, parallel I/O can yield significant performance benefits. NetCDF supports parallel I/O of netCDF/HDF5 files with the parallel I/O features of the HDF5 library. Parallel I/O to classic and 64-bit offset format is provided with the help of the parallel-netcdf library from Argonne/NorthWest University.

Software Architecture

The architecture of the C/Fortran/C++ libraries has changed to support the use of other libraries. NetCDF can still be built to only use the classic netCDF library.

Enhanced Data Model

The enhanced data model allows for more complex representations of data.

A netCDF-4 file can organize variable, dimensions, and attributes in groups, which can be nested. Variables also have attributes. Variable may share dimensions, indicating a common grid. One or more dimensions may be of unlimited length.

Remote Data Access

The built-in opendap client allows netCDF applications to access data stored on remote data servers, as if it were local.

Unidata

Mission: To provide the data services, tools, and cyberinfrastructure leadership that advance Earth system science, enhance educational opportunities, and broaden participation.

Unidata, funded primarily by the National Science Foundation, is one of eight programs in the University Corporation for Atmospheric Research (UCAR) Office of Programs (UOP). UOP units create, conduct, and coordinate projects that strengthen education and research in the atmospheric, oceanic and earth sciences.

Unidata is a diverse community of over 160 institutions vested in the common goal of sharing data, and tools to access and visualize that data. For 20 years Unidata has been providing data, tools, and support to enhance Earth-system education and research. In an era of increasing data complexity, accessibility, and multidisciplinary recapitulation, Unidata provides a rich set of services and tools.

Commitment to Backward Compatibility

Because preserving access to archived data for future generations is sacrosanct:

- NetCDF-4 provides both read and write access to all earlier forms of netCDF data.
- Existing C, Fortran, and Java netCDF programs will continue to work after recompiling and relinking.
- Future versions of netCDF will continue to support both data access compatibility and API compatibility.

Unidata: www.unidata.ucar.edu