
Plans for an Enhanced NetCDF-4 Interface to HDF5 Data

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What is NetCDF?

- Similarities with HDF5:
 - A scientific data model
 - A data access library and set of interfaces
 - A format for storing and accessing data
- Differences from HDF5:
 - Simpler, more widely used (currently)
 - Less powerful, less performance-oriented
- Current version: netCDF-3 is supported by UCAR Unidata Program

NetCDF-4/HDF5 Goals

- Combine desirable characteristics of netCDF and HDF5, while taking advantage of their separate strengths:
 - Widespread use and simplicity of netCDF
 - Generality and performance of HDF5
- Preserve format and API compatibility for netCDF users
- Demonstrate benefits of combination in advanced Earth science modeling efforts

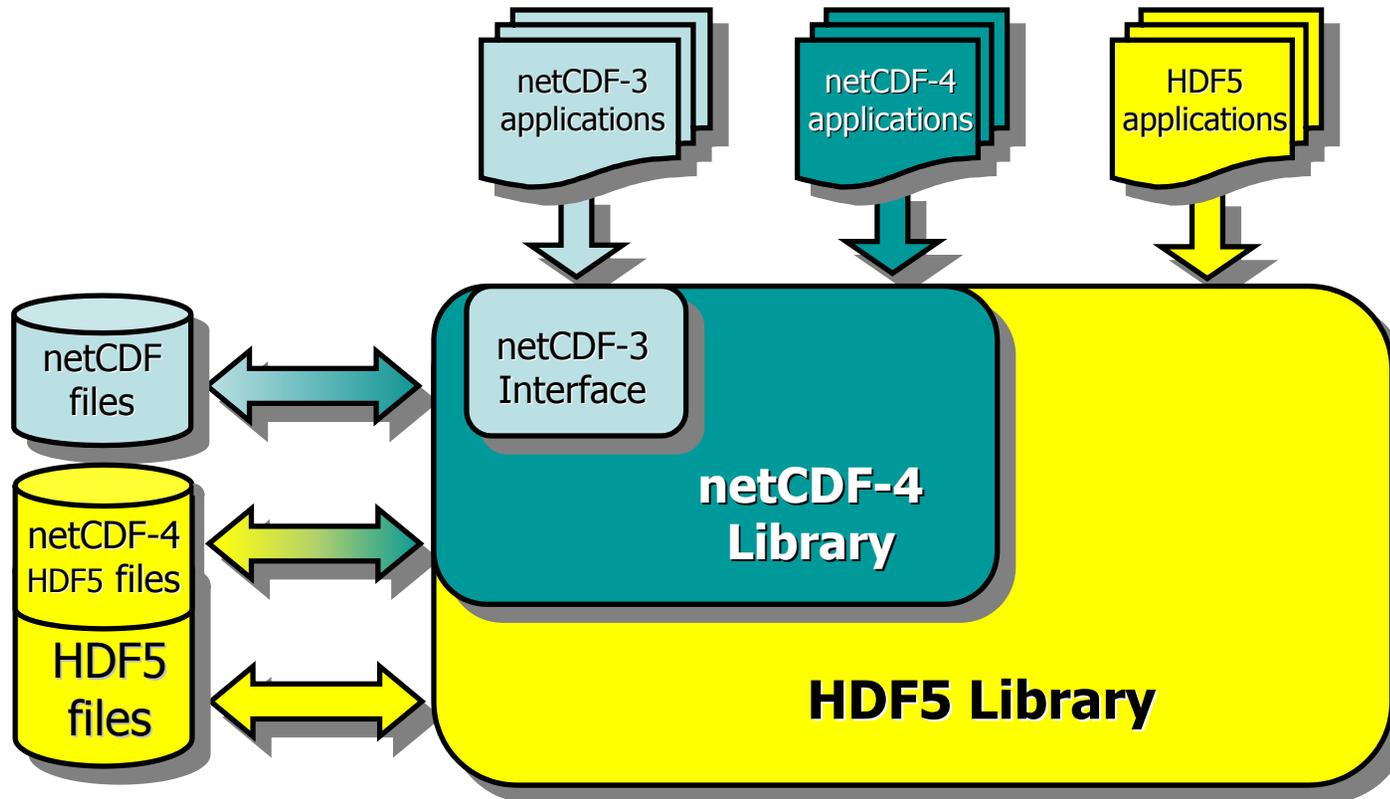
NetCDF-4 Features Enabled by HDF5

- Large file support
- Parallel I/O
- Multiple dynamic dimensions
- Packed data, compression
- New data types
- Dynamic schema modifications
- Other possibilities: groups, Unicode, user-defined types, better coordinate support, ...

Backward Compatibility

- Two kinds of compatibility:
 - **API:**
 - Extension of netCDF-3 API
 - Support existing netCDF-3 applications by recompiling/relinking
 - **Format:**
 - Access to existing netCDF-3 data
 - Access to HDF5 files written through netCDF-4 interface
- Leverage C interface for other interfaces to Fortran90, C++, Perl, Ruby, ...
- Java interface must be developed separately

NetCDF-4 Architecture



- Supports access to netCDF files and HDF5 files created through netCDF-4 interface

NCSA Contributions

- Overall design
- Dimension scales
 - To support shared dimensions
 - Addition to HDF5 data model
- Parallel I/O
 - Using Argonne/Northwestern work
 - Challenging performance goal

Acknowledgments and URL

- The netCDF-4/HDF5 project is funded by the NASA AIST program
- Unidata is sponsored by the National Science Foundation
- URL:
www.unidata.ucar.edu/packages/netcdf-4