Common Data Format: New XML and Conversion Tools

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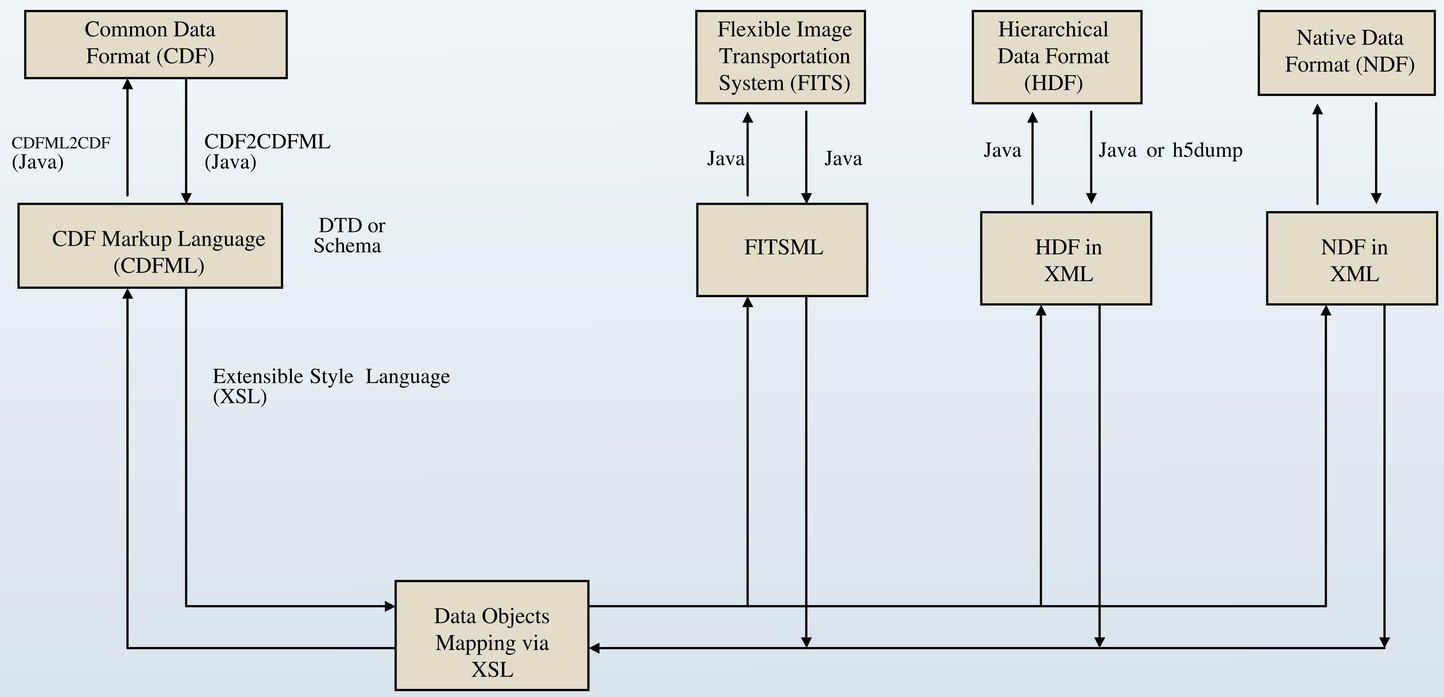
Interoperability with Other Data Formats using XML



Abstract

The variety of available data formats (e.g. CDF, netCDF, HDF, etc.) has been a problem for scientists (because data of their interest must be translated into the format they understand before they can analyze data), and it will continue to be a problem for years to come. In a bid to make data format differences transparent to the end users, the CDF office has employed the eXtensible Markup Language (XML) technology and has been developing custom ad-hoc translators to facilitate and promote data interoperability with other data formats.

Software for CDF

- IDL, MATLAB, IBM DX, Application Visualization System
- NSSDC developed Web-based systems
  - CDAWeb (http://cdaweb.gsfc.nasa.gov/cdaweb)
  - SSCWeb (http://sscweb.gsfc.nasa.gov)
  - COHOWeb (http://nssdc.gsfc.nasa.gov/cohoweb/cw.html)
  - OMNIWeb (http://cdaweb.gsfc.nasa.gov/omniweb/ow.html)
- CDAWlib (http://spdf.gsfc.nasa.gov/CDAWlib.html)
  - A set of IDL routines that allow users to manipulate data store in CDF
  - Available at ftp://cdaweb.gsfc.nasa.gov/pub/CDAWlib
- Standard CDF tools (CDFcompare, CDFconvert, CDFedit, CDFexport, CDFstats, SkeletonTable, SKeletonCDF)
  - Distributed as part of the standard CDF distribution package
  - See http://nssdc/cdf/html/FAQ.html for a detailed description of each tool

What is CDF

- Self-describing platform-independent scientific data format
- Available on all major platforms
  - Unix (HP, AIX, Sun OS, Solaris, Linux, SGI)
  - Windows 95/98/NT/2000
  - Macintosh OS 8.x, 9.x, 10.x
  - DEC (VMS, OpenVMS, Ultrix, OSF/1)
- Interfaces supported: C, Fortran, Java, and Perl
- See more information at the CDF FAQ page (http://nssdc.gsfc.nasa.gov/cdf/html/FAQ.html)

CDF Markup Language (CDFML)

- XML Markup Language describing Common Data Format (CDF) data and metadata
- A CDFML file (XML file) is an ASCII representation of a CDF file
- XML promotes and facilitates data interoperability with other science data formats (since translation to and from another data format via XSL is easy)

Future Work

- Two-way netCDF-to-CDF translator
- CDF-to-FITS translator
- Sparse array
- Grouping capability
- Ability to handle files that are > 2 GB
- Open to community feedback

CDF Translators

- HDF5-to-CDF
  - Tested against ACE SWICS L2 datasets
- FITS-to-CDF
  - Tested against HEASARC datasets
- netCDF-to-CDF (will be developed in the near future)