Nexus brings neutrons and synchrotrons together

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Nexus is a data format which historically originated in the neutron and muon community. The recent meeting held jointly by the ILL and ESRF in Grenoble in February has shown that Nexus could serve as a common format for neutrons, muons and synchrotrons.

The Nexus International Advisory Committee met in February 2006 at the ILL/ESRF. There were 25 people from 16 different insitutes present. Of the 16 institutes 11 institutes were neutron facilites, 4 were synchrotrons and 1 was a muon facility. The meeting lasted 3 days and the time was split up into discussions around high level instrument definitions, how to apply Nexus to synchrotons and getting up-to-date on the latest developments of the underlying data format HDF.

Nexus is a way of storing data and its associated metadata. The metadata describes the data, under what conditions it was taken, what the environment was doing, what processing or analysis the data has undergone. Nexus stores data in HDF or XML format. HDF has been designed to store n-dimensional data efficiently. This is important for synchrotrons where a large percentage of the data produced is in the form of images.

Nexus supports its own application programmer's interface for C and Fortran programmers on top of HDF. The api supports switching between HDF and XML data formats transparently.

Nexus can be used for storing general data for scanning instruments or data generated by data analysis programs. Nexus can also be used to store instruments descriptions for experiments. Insturment defintions exist for Time of Flight, Small Angle Scattering, Reflectometer, Spectrometer and Spin-Echo type minstruments. Synchrotrons that are starting to adopt Nexus use Nexus as a generic data format. Neutron institutes that have been using Nexus for a longer time are starting to adopt the instrument definitions to store metadata.

The ultimate goal of Nexus is to encourage a common data format for data storage and analysis programs. With the rise of GRID based applications which need a common way of storing and recovering metadata Nexus is well poised to fulfill this role.

PICTURE: put a picture of a plot of neutron + synchrotron data

For more information refer to the following links :

1. Nexus home page - http://www.nexus.anl.gov/
2. HDF home page - http://hdf.ncsa.uiuc.edu/