

**Minutes of the NeXus International Advisory Committee
Meeting in Pasadena, CA
Sept. 8-10, 2003**

In attendance:

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Members of the NeXus International Advisory Committee (NIAC):

Frederick Akeroyd	Joern Beckmann
Stephen Cottrell	Ron Ghosh
Nick Hauser	Jason Hodges
Przemek Klosowski	Mark Koennecke
Ray Osborn (Chair)	Toshiya Otomo
Peter Peterson (Executive Secretary)	Thomas Proffen

Members of the Technical Special Interest Group:

Frederick Akeroyd (ISIS, UK)	Joern Beckmann (FRM-II, Germany)
Uwe Filges (PSI, Switzerland)	Przemek Klosowski (NCNR, USA)
Mark Koennecke (PSI, Switzerland)	Kevin Knowles (ISIS, UK)
Jens Krueger (FRM-II, Germany)	Nick Maliszewskyj (NCNR, USA)
Christopher Moreton-Smith (ISIS, UK)	Ray Osborn (IPNS, USA)
Peter Peterson (SNS, USA)	John Tischler (APS, USA)

Monday, September 8, 2003

Action Items:

1. Write a summary report to send to facility directors
2. Compile biographies of existing members to publish on NeXus website

Resolved Items:

1. Ratified terms of reference
2. Approved method for ratifying new NeXus classes

Tuesday, September 9, 2003

Action Items:

1. Write a white-paper on using XML Schema (XSD) as archival form of instrument definitions and class templates. (Oct 10: F. Akeroyd and P. Peterson)
2. Report on more complex mark up for XML format (Sep 25: N. Maliszewskyj)
3. A series of HOWTOs and FAQs will be compiled. Topics to be covered will be
 - a. Compiling, linking against, and installing
 - b. Reading and writing a file
 - c. Writing an instrument definition
 - d. Identifying plottable data(P. Klosowski)
4. Formal proposal of `nxposition`, which incorporates `nxgeometry` and `nxtranslation`. (Sep 25: F. Akeroyd)
5. Formal detector geometry proposal. (Nov 15: J. Hodges, P. Peterson, F. Akeroyd, M. Koennecke)
6. Formal proposal of API implementation of “`link`” attribute. (M. Koennecke)

Official Recommendations:

1. Preferred file extension is “.nxs”, but use of “.hdf”, “.h5”, “.xml” and other extensions are permitted.

Resolved Items:

1. Instrument definitions and class templates will be stored in metaDTD format until more appropriate final storage can be determined. (J. Beckmann against)
2. Instrument definitions and class templates will be fully self describing.
3. Archival form of instrument definitions and class templates will reside in a CVS repository.
4. Class templates will exist for base classes which can be put together to create an instrument definition which is used for validation.

5. <analysis> item within an NXentry will be replaced with an item <definition version="">{URL}</definition>.
6. A right-handed coordinate system is defined with the positive z-axis along the beam when facing downstream.
7. Instrument definitions, or class templates, will not be subclassed.
8. If a simplified position is needed the entries will be distance, polar_angle, azimuthal_angle.
9. When NXdetector is included in a file, there will be a one-to-one correspondence between NXdata and NXdetector.
10. Units will be specified in the singular.
11. Axes in NXdata will be described in one of two ways:
 - <counts type="NX_FLOAT[i,j]" axes="[time_of_flight,polar_angle]"/>
 <time_of_flight units="micro*second" type="NX_FLOAT[i]"/>
 <polar_angle units="degree" type="NX_FLOAT[j]"/>
 - <counts type="NX_FLOAT[i,j]"/>
 <time_of_flight units="micro*second" type="NX_FLOAT[i]" axis="1" primary="1"/>
 <polar_angle units="degree" type="NX_FLOAT[j]" axis="2" primary="1"/>
 <wavelength units="10^8 meter" type="NX_FLOAT[i] axis="1" primary="2"/>
12. Histograms can be specified either by having an extra element in the axis array or with an attribute histogram_offset in the axis.
13. Preferred method for connecting NXdata to NXdetector is by using a link attribute in an axis.
14. Physical units will be specified in accordance with the Unidata udunits utility, with restrictions to be proposed by M. Aivazis. Dates and times will be specified in accordance with the ISO8601 format.
15. Positions will be stored as the physical (effective) position. This includes, not exclusively, motor and detector positions. Motor offsets will be stored as attributes on the appropriate data.
16. NXroot will be defined as


```

      <NXroot file_name="{File name of original NeXus file}"
        file_time="{Date and time of file creation}"
        file_update_time="{Date and time of last file change at close}"
        NeXus_version="{Version of NeXus API used in writing the file}"
        HDF_version="?"
        HDF5_version="?"
        creator="{facility or program where file originated}?">
        <NXentry name="{entry name}">+</NXentry>
      </NXroot>
      
```
17. Templates will not specify bit length for primitives. e.g. NX_UINT, NX_INT, and NX_FLOAT are all that are allowed for numerical items.
18. The template for NXentry is


```

      <NXentry name="{Entry Name}">
        <title>{Extended title for entry}</title>
        <definition version="{DTD version number}" URL="{URL of DTD file}">{Name of entry DTD}</definition>
      </NXentry>
      
```

```

<start_time type="ISO8601">{Starting time of
  measurement}</start_time>
<end_time type="ISO8601">{Ending time of
  measurement}</end_time>
<duration type="NX_INT" units="seconds">{Duration of
  measurement}</duration>
<experiment_identifier
  type="NX_CHAR[ ]">{ }</experiment_identifier>
<run_number type="NX_INT">{Number of run or scan stored in
  this entry}</run_number>
<run_cycle type="NX_CHAR[ ]">{ }</run_cycle>
<program_name version="{Program version number}">{Name of
  program used to generate this file}</program_name>
<command_line>{Name of command line used to generate this
  file}</command_line>
<notes>{Notes describing entry}</notes>
<NXuser name="{user}"></NXuser>
<NXsample name="{sample}"></NXsample>
<NXinstrument name="{Name of instrument}"></NXinstrument>
<NXmonitor name="{Name of monitor}"></NXmonitor>
<NXdata name="{Name of data block}"></NXdata>
</NXentry>

```

Wednesday, September 10, 2003

Action Items:

1. Review the implications associated with Unicode in files (Technical Committee)
2. Review of the distribution attribute for specifying how histogrammed data is specified, such as integral value or density. (R. Osborn and F. Akeroyd)
3. XML based NEXUS API whitepaper (M. Koennecke, N. Maliszewskyj, P. Klosowski, and P. Peterson)
4. Methods for producing binary distributions will be established by N. Maliszewskyj (RPM), M. Aivazis (DEB), F. Akeroyd (Install Shield), and J. Beckmann (Digital Unix)
5. A working group will decide how the CVS directories will be reorganized (Oct 15: R. Osborn, J. Beckmann, M. Aivazis)
6. All known Python ports of the NeXus API will be resolved into a single version to be released to the public. Afterwards, an object oriented layer on top of the core NeXus API will be explored in Python. (M. Aivazis)
7. Voting on class templates will commence on November 1, 2003.
8. A whitepaper for converting existing NeXus files into files compliant with the new standard will be written (M. Koennecke and P. Peterson)
9. Members of the NIAC will nominate instrument editors by October 1, 2003
10. The current templates with formatting changes and the ISIS NeXus document will be combined before debate will commence. (P. Peterson)
11. Definition of how to store sparse data, e.g. event data. (P. Peterson)

Official Recommendations:

1. Inside character array containing history logs, and outside of a `NXlog`, a date or time should have “`TIMESTAMP:`” preceding the ISO8601 time to make parsing easier.
2. Before starting a new project focus on NeXus, such as porting the API to a new language or writing a NeXus-enabled application, an announcement should be made to the NeXus mailing list and a site should be put up for comments on the new project, *e.g.* on the NeXus Swiki.

Resolved Items:

1. New type `NX_BINARY` (unsigned 8 bit integer) with an attribute `mime_type` for storing a variety of binary data.
2. New type `NX_BOOLEAN` with value zero (false) or one (true). Implementation of type to be determined later.
3. `NX_CHAR` array should use end of line character “`\n`” in the text.
4. The `NXcounter` group will be incorporated into the `NXmonitor` group.

5. `NXinstrument` template consists of at least the following groups

```

<NXinstrument>
  <name short_name="{abbreviated name of instrument}">{name
    of instrument}</name>
  <NXsource/>
  <NXcrystal/>
  <NXdisk_chopper/>
  <NXfermi_chopper/>
  <NXvelocity_selector/>
  <NXguide/>
  <NXcollimator/>
  <NXaperture/>
  <NXfilter/>
  <NXattenuator/>
  <NXpolarizer/>
  <NXflipper/>
  <NXmirror/>
  <NXdetector/>
  <NXbeam_stop/>
</NXinstrument>

```

6. Each `NXlog` will contain information for one variable.

7. The definition of a `NXlog` is

```

<NXlog name="{identifier for the log}">
  <description>{longer description of what is
    logged}</description>
  <time start="{written in ISO8601}" units=""
    type="NX_FLOAT">{time axis for logged quantity}</time>
  <value units="{units of logged value}"
    type="NX_FLOAT|NX_INT">{array of logged value, such as
    temperature}</value>
  <raw_value units="{units of raw values}"
    type="NX_FLOAT|NX_INT">{array of raw information, such
    as voltage on a thermocouple}?</raw_value>
</NXlog>

```

8. File directories with a NeXus section will have “`nexus`” in lowercase.

9. An version of the NeXus API to read and write NeXus files in XML format will be created.
10. Current members of the NeXus developers mailing list are the members of the NeXus technical special interest group.