XAL Status Report
Spring 2009

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EPICS Collaboration Meeting
April 30 to May 2, 2009
Vancouver, Canada
Active Developers at SNS

- Chris Allen
- Delphy Nypaver Armstrong
- Sarah Cousineau
- John Galambos
- Tom Pelaia
- Andrei Shishlo
- Yan Zhang
- Alexander Zhukov
What is XAL?

• Development environment for creating accelerator physics applications, scripts and services
  – Control room applications
  – Analysis applications

• Application framework

• Toolbox of Java packages

• Ant based build system (independent of IDE)

• Developed initially for the Spallation Neutron Source (SNS)

• Used in commissioning and running SNS
XAL Architecture

**Foundation:** Solver, Online Model, Channel Access, Data Access, Math Tools, Messaging, ...

- **Document based Java Applications**
- **Application Framework**
- **Bricks GUI**
- **JRuby and Jython Scripts**
- **Services**
Current Statistics

• More than five dozen applications
• Three services
• Several scripts
  – many have user interfaces
Growing Collaboration

• Home: http://www.ornl.gov/~t6p/Main/XAL.html

• Source Forge Project: xaldev
  – http://sourceforge.net/projects/xaldev
  – Source code managed using Subversion

• Dozens of developers among several sites
  – SNS, SLAC, JPARC and others interested
  – Paul Chu (SLAC) has been actively contributing to the SNS source code
  – GANIL, MSU/RIA, TRIUMF evaluating XAL

• Contact us to participate
FY 2009 Plan
http://www.ornl.gov/~t6p/Main/XALBlog/Entries/2008/8/26_XAL_Enhancement_Activity.html

✓ Reduce and document third party jar files
✓ Remove proprietary charting packages
  • Improve and enhance the online model
✓ Remove deprecated applications and code
✓ Fix broken Javadoc documentation
  • Provide an XAL Lite branch
✓ Provide better online documentation
  • Improve application launcher
  • Build an agent based system

✓: complete, •: to do
Reduce and document third party jar files; Remove proprietary charting packages

• Number one obstacle to adopting XAL
• Eliminated half of the third party jars
• Eliminated proprietary charting packages
• Obtained permission from some vendors to redistribute their jar files along with XAL
• Improved documentation of the third party jars
Remove deprecated applications and code

• Removed deprecated applications
  – JERI, XIO, Loss Viewer, Charts, Orbit Display, SCL AFF Monitor, MPS Post Mort

• Removed deprecated files and code
  – Application File Chooser Factory
  – gov.sns.tools.samples.widgets
  – UML files

• Ongoing effort to reduce and cleanup code
Fix broken Javadoc documentation

• Corrected hundreds of Java Doc errors
• Ongoing effort to fix remaining errors
Provide better online documentation

• Published a Quick Start Guide
  – http://www.ornl.gov/~t6p/Main/XALQuickStart.html
  – checkout, configure, build, run

• Maintain Java Doc

• Maintain Xcode indexed Documentation Set
Synchronizing SNS XAL Repository to Source Forge xaldev Repository

• We regularly push SNS modifications to the main branch of the Source Forge xaldev repository

• We still need to develop a strategy for collaboratively sharing the xaldev repository
Support for Software Types

New Feature

• Previously, a node type mapped to a single node subclass

• Now, a node type along with a software type map to a single node subclass
  – Accommodates API variations and migration across devices of the same device type
  – Introduces optional softType attribute for devices in the implementation mapping file
  – Backward compatible
  – Wire Scanner ("WS") type is an implementation
Key Value Access

New Feature

• KeyValueAdaptor provides access to an object’s value corresponding to a key path identifying a method chain
  – Caches accessor methods dynamically as needed for performance
  – Allows method calls by name

• KeyValueTableModel allows for convenient, dynamic construction of a table model
  – List of objects provide the table rows
  – Array of key paths specify table columns
  – Cell data retrieved using Key Value Adaptor
  – Very flexible
Combo Sequence Composer

New Feature

• User can combine sequences into combo sequence

• Offers a streamlined replacement of the cumbersome, deprecated SeqSelector
  – User only has to provide the start and end sequences
  – User gets immediate feedback whether the start and end sequences can be combined
Node Channel Selector

New Feature

• Nodes channels displayed in flat table
  – no cumbersome tree hierarchy
  – displays node name, node type, channel handle

• Quick node selection
  – type parts of record to filter table of channels
  – double click to quickly select a single channel
  – allows multiple selection
XYZ Correlator

New Features

• Migrated charts from proprietary to XAL
• Improved fitting
• Correlate arbitrary number of PVs and dump the buffer to a file
• Quick selection of XAL channels
• Bricks user interface
**PV Histogram**

**New Application**

- Monitors a single channel
- Plots a histogram of the value
- Automatic or custom range
- Simple statistics
Resources

• Home: http://www.ornl.gov/~t6p/Main/XAL.html

• News Feed: http://www.ornl.gov/~t6p/Main/XALBlog/XALBlog.html

• Open Source Code: http://sourceforge.net/projects/xaldev