PDV – a PVSS Data Viewer Application
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The PDV Data Viewer (PDV) has been developed to access and control data of the Pixel detector of the ATLAS experiment, with an effort to be sufficiently generic to provide access to data of other subdetectors and even data of other experiments or PVSS systems in general. Other important keys for the design were independence from any existing PVSS installation and universality regarding operation systems or user environments.

Design Criteria
- Generic/PVSS/PvssDb interface
- Basic analysis functions
- Universal (Java VM)
- No OS, environment or policy dependency
- Window-dismissible (Java Native Launch Protocol, JNLP)
- No dependency on PVSS installation
- Decompression and clever display
- Universal API
- "All possible" save-as options

Technical Implementation
A data flow diagram embedding the URL for the software design is shown below. The user interacts with the application mainly through the DPE (data point element) name selector dialog and the display panel at the bottom of the screen, which includes a selected display area.

Screenshot of a typical user session on Mac OS X

Application Features 1: Invalid data
- Invalid data tagged by PDV through a 32 bit mask
- Filtering of invalid data by PDV, fully customizable bit mask
- No data display on unchanging value
- Empty display due to compression of stable DPE values

Application Features 2: DPE search
- Search of DPEs with regular expression patterns
- DPE names
- DPE comments
- Examples of search in the DPE Selector window

Application Features 3: History
- User typically rename some groups of DPEs routinely or, more generally, want to re-make a display query that they have executed formerly. The PDV retains the last executed queries for each user in the user specific PVSS database (situated in the "home" directory).

Application Features 4: Export and Save Data
- The possibility of exporting displayed data after a query has been explored exhaustively and is probably the most complete feature of the PDV in its present state. Besides the standard graphical export,
- User provided code, stored in jar or class file in user directory

Software management and frameworks
- The source code of the PDV application has been successfully managed with CVS as repository and Savannah for user feedback, bug tracking and task management. Migration from CVS to SVN has been performed using the Python script cvs2svn.
- The Eclipse IDE has been mandatory, but turned out to be the favored tool of all developers and contributors.
- Source code is open, property of CMS/PP/2003.
- The initially used graphical library iChart2D has been replaced by JFreeChart, as we expected it to provide better support and documentation, faster rework to bug reports and easier integration of bug fixes from our side.

Experience and Future
- After the first year of development of the PDV application, many additional requests, in addition to the basic functions have been made by the user community.
- Some subdetector specific requirements come up with the D/PVSS universe.

References
- http://cern.ch/twiki/bin/view/Atlas/PDV
- http://pvss.at