

Web Based Tools for Data Access and Monitoring

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& others

Overview

- Why Web Based?
- Implementation
- Software Background
- Components
- Sample Web Applications
- Data Origin
- Limitations
- Future Development

Why Web Based?

- Everybody has a browser
 - No additional software is required
- Web applications can be accessed from anywhere
- Scalable
 - More servers can be added
- Web servers can sit across firewalls
 - Displaying protected data

Implementation

- JSP (Java Server Pages)
 - Comes with set of tag libraries
 - Core (if, choose, for)
 - Functions (String manipulation)
 - SQL (for queries)
 - Allows Non Java Programmers to access functionality using HTML-like syntax
 - Custom tags can be easily written
 - Either in JSP or Java

```
<sql:query var="data" dataSource="jdbc/exo-sc-datainfo">
    select * from datainfo
</sql:query>

<c:forEach var="row" items="${data.rows}" >
    ${row}
</c:forEach>
```

Implementation

- Java
 - For more advanced features
 - Login Filter
- Apache Tomcat Servers
 - Deployment environment
 - Very stable
- Libraries
 - Sitemesh (templates)
 - Display tag (tables)
 - AIDA (Plotting, Histogramming)
 - Common Application Framework in Java
- JavaScript
 - Very limited use

Software Background

- Developed for Fermi
 - Over 20 web applications
 - Independent development
 - Used daily for ~ 2 years
 - Tested under heavy traffic and data conditions
- Recently generalized to be experiment independent
 - Common features can be reused and shared
 - Experiment specific code can be plugged in
 - EXO is a new user, CDMS is interested, LSST is evaluating a toy application

Components

- Authentication
- Authorization
- Look & Feel

Authentication

- Single Sign On CAS server
 - <https://glast-ground.slac.stanford.edu/cas/>
 - Still has “glast” in it for “security” reasons
 - Log in once in 24 hours
 - All other applications will see you are logged in
- Authentication against SLAC Kerberos servers
 - Either Unix or Windows password will do
- Other authentication can be added

Authorization

Group Manager

- List of users for a given experiment
- Allow create and assign groups
 - Acts as web service to grant authorizations
- Fetch user's information
 - New User's Management System is being developed (Karen)
- Libraries to access web service
 - Tld for Web applications
 - Jar for Java programs

Look & Feel

- The challenge:
 - Guarantee a uniform/common look & feel
 - Not burdening developer (too much)
 - Flexible
 - Easy to deploy changes
- The solution:
 - Templated pages using Sitemesh (open source)
 - Strips pages and decorates them
 - Centralized “services” for:
 - Style sheet
 - To make all tables look the same (if desired)
 - Menu Bar
 - Icons/Images

Sample Web Applications

- Portal ([Fermi](#), [EXO](#))
- [Data Monitoring](#)
- [Data Processing](#)
- Trending ([Fermi](#), [EXO](#))
- Reports ([Weekly](#), [Daily](#))

Portal

- Database Driven structure
 - Same as menu bar
 - Single entry point for menu bar
 - <http://srs.slac.stanford.edu/Commons/menuBar.jsp?experimentName=EXO>
 - Decorated via stylesheet
 - <http://srs.slac.stanford.edu/Commons/css/srsCommons.jsp>

Data Monitoring

- For Fermi Runs:
 - Display Histograms and Trending plots
 - Plots can be exported
 - Alarms
 - Errors
 - Images

Data Processing

- Tabular representation of data processing
- Links to:
 - Pipeline processing tasks
 - Data Catalog products
 - Logs Entries
 - Data Monitoring products

Trending Tool

- Fetch data from mySql database
- Two flavors:
 - Accumulated
 - Full history
- Tabular form
 - Easy to export
- Common Trending API
 - [Export to XML](#) for programmatic access
 - Cross trending
 - Reports

Data Origin

- Trending Plots
 - Oracle
 - mySql
- Histograms
 - Root files
 - NFS or through Scalla
 - Via Remote AIDA
 - From a running Java program, XML over RMI
- Images
 - Disk or via Data Catalog

Limitations

- Not as dynamic as GUI application
 - No D&D
- Can be wasteful and inefficient
 - To update a table's cell the whole table needs to be reloaded
- Plots are static
 - Axis cannot be dragged

Future Development

- GWT Google Web Toolkit
 - To overcome the limitations of web applications
 - More interactive applications
 - More efficient
- Client side code is written in Java
- GWT converts it to JavaScript and AJAX
 - For several browsers
- Examples
 - [Data Cat \(old\)](#)
 - [EXO DAQ GUI](#)
- Good Topic for future talk?