

Current Status.

Implementation:

Basic SDA applications were implemented and tested:

SDA Viewer – browsing collected data.

SDA Editor – allows for creating and editing configuration.

SDA Beanshell Sandbox – generating reports, tables, basic processing.

OSDA API – API for analysis programs.

Fermilab Collider Run II data was imported into the system to test the performance of the XML database.

A plugin-based SDA Data Acquisition System has been build for ACNET and for the SCF interface to EPICS. Testing of these plugins is underway.

Beanshell Sandbox

The screenshot shows a web browser window titled "Beanshell interface to SDAII API". The address bar shows the URL "http://www-bd.fnal.gov/SDAII/bsh.html". The page content is divided into two main sections: a script editor on the left and a results display on the right.

The script editor shows the following code:

```
Request took 28141 ms
// Script Example
import gov.fnal.controls.tools.sda_with_xldb.*;
//ApiBase.clearAll();

// load a "common" or "tbolesh", "array-utils.bsh" and
// "html-utils.bsh" to see what is there and to read comments
// and explanations

lib("tbolesh/array-utils.bsh");
lib("tbolesh", "html-utils.bsh");

int store = 4666;
if( parameter("store")!=null ) store = Integer.parseInt(parameter("store"));
String fmt = "###0.###";
if( parameter("format")!=null ) fmt = parameter("format");
if("null".equals(fmt) || "none".equals(fmt)) fmt = null;

//----- Declaring a Variable -----
v0 = ApiBase.getAcnetVariable(
    "ColliderShot", store, "HEP", "C:BOILUM[1:36]", "all");
v1 = ApiBase.getAcnetVariable(
    "ColliderShot", store, "HEP", "C:DOILUM[1:36]", "all");
v2 = ApiBase.getAcnetVariable(
    "ColliderShot", store, "HEP", "C:FBIPIWG[1:36]", "all");
v3 = ApiBase.getAcnetVariable(
    "ColliderShot", store, "HEP", "C:FBIANG[1:36]", "all");

//-----
t = System.currentTimeMillis();
//_All declared Variables will be read on first "data" request _
v1.isMultiSet(); // I am asking for isMultiSet here only for measuring
// request time, because it triggers data collection.
print( "time taken for data reading is "+(System.currentTimeMillis()-t)+
    " ms<br/>");
t = System.currentTimeMillis();
makeHtmlTable_SAD( v0, fmt );
print( "making the table "+(System.currentTimeMillis() - t)+" ms<br/>");
t = System.currentTimeMillis();
makeTranspTable_SAD( v1, fmt );
print( "making the table "+(System.currentTimeMillis() - t)+" ms<br/>");
t = System.currentTimeMillis();
makeHtmlTable( v2, fmt );
print( "making the table "+(System.currentTimeMillis() - t)+" ms<br/>");
```

The results display shows a table of data points:

idx/set	1	2	3	4	5	6
sum	139.176	134.95	130.708	126.998	123.723	116.763
average	3.866	3.749	3.631	3.528	3.437	3.243
deviation	0.65	0.636	0.617	0.6	0.588	0.568
1	3.763	3.669	3.554	3.466	3.364	3.308
2	4.126	4.009	3.883	3.769	3.71	3.513
3	4.252	4.113	3.972	3.909	3.799	3.615
4	3.656	3.558	3.438	3.368	3.267	3.085
5	4.912	4.795	4.625	4.515	4.387	4.244
6	4.282	4.134	4.003	3.883	3.818	3.639
7	4.069	3.977	3.844	3.746	3.618	3.358
8	3.003	2.921	2.833	2.769	2.696	2.528
9	3.765	3.664	3.514	3.428	3.34	3.163
10	3.154	3.026	2.92	2.858	2.763	2.583
11	3.412	3.283	3.194	3.106	3.028	2.82
12	3.339	3.216	3.097	2.985	2.909	2.77
13	3.818	3.73	3.613	3.484	3.437	3.341
14	4.378	4.264	4.155	4.013	3.964	3.727
15	4.486	4.331	4.209	4.11	4.004	3.759
16	4.218	4.119	3.974	3.867	3.724	3.53
17	5.159	5.055	4.917	4.748	4.7	4.521
18	4.248	4.136	4.001	3.887	3.794	3.539
19	3.853	3.743	3.61	3.538	3.436	3.158
20	3.634	3.529	3.433	3.33	3.227	3.057
21	4.424	4.241	4.109	3.957	3.881	3.636

Roadmap:

The system will be tested this summer on real data from the Tevatron.

JAS plugins will be written for portable SDA.

LHC and EPICS plugins.

Extensive documentation with examples in several programming languages.

Reference's:

[1] T.B. Bolshakov, P. Lebrun, S.Panacek, V. Papadimitriou, J. Slaughter, A. Xiao (Fermilab), "SDA-based diagnostic and analysis tools for Collider Run II," PAC'05, Knoxville, USA, May 2005

[2] A. Xiao, T. Bolshakov, P. Lebrun, E. McCrory, V. Papadimitriou, A.J. Slaughter, "Tevatron beam lifetimes at injection using the Shot Data Analysis system," PAC'05, Knoxville, USA, May 2005

[3] <http://www.sleepycat.com/products/bdbxml.html> (Berkley XML DB documentation)

[4] T. Bolshakov, K. Genser, K. Gounder, E. S. McCrory, P. L. G. Lebrun, S. Panacek, V. Papadimitriou and J. Slaughter, "Data acquisition and analysis for the Fermilab Collider RunII", ICAP'04, St Petersburg, Russia, July 2004

[5] The Fermilab RunII Handbook, at <http://www-fnal.fnal.gov/runII/index.html>