Archive Transition to Oracle

The "Channel Archiver" stored its data in a custom arrangement of data files. It was optimized for writing a lot of data quickly. On the downside, it was impossible to maintain that data in the long run.
Consequently we developed a new archive system which stores data in a relational database (RDB, Oracle) with better tools for long-term data maintenance.
The RDB-based archive system has been available since May 2009, and when entering an accelerator maintenance period most of the old Channel Archiver sample engines were stopped on July 13, 2009.

Viewing Archived Data

Both old (Channel Archiver) and new (RDB) data is accessible in the Control System Studio (CSS) Data Browser. CSS is installed in the SNS control room, and available for office PC download from https://ics-web.sns.ornl.gov/css.

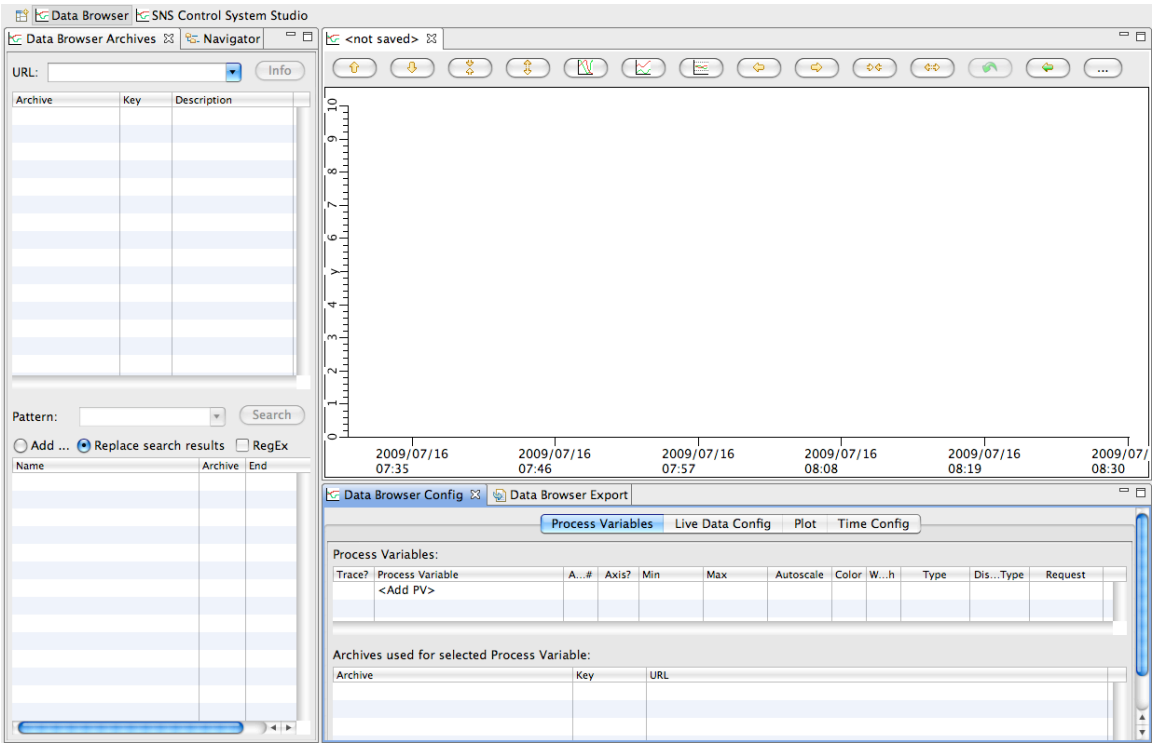
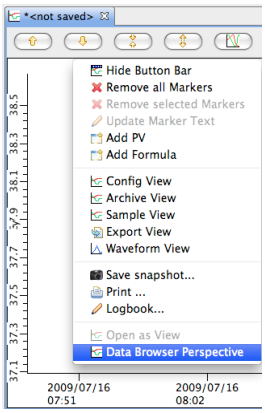


Figure 1: Empty Data Browser plot in Data Browser perspective with *Data Browser Archives* and *Data Browser Config* panel.

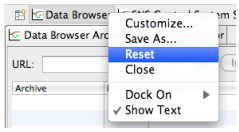
To view archived data, assuming you know the PV name:

1. Start CSS
2. Select Menu CSS/Trends/Data Browser
3. If your screen differs from Fig.1, i.e. you see no *Data Browser Config* and/or no *Data Browser Archives* panel, follow instructions in Fig. 2.
4. Add the PV to the plot by either
    a. Right-clicking on the plot, selecting "Add PV", enter the PV name, press OK
    b. Clicking on the "<Add PV>" space in the *Data Browser Config* panel, enter PV name, press Return/Enter.

By default the result should be as in Fig. 3: *Archives used for selected Process Variable* lists both the new RDB data source as well as the old ' … All …' sources. When setting a *Marker* by clicking on a sample in the plot, data from July 13 on will only be found in the RDB, while the Channel Archiver has data before that transition.



1. Right-click on Data Browser plot, select *Data Browser Perspective*.



2. Right-click on *Data Browser* tab in top-left corner of window, select *Reset*.

Figure 2: Resetting CSS to look like Fig. 1.

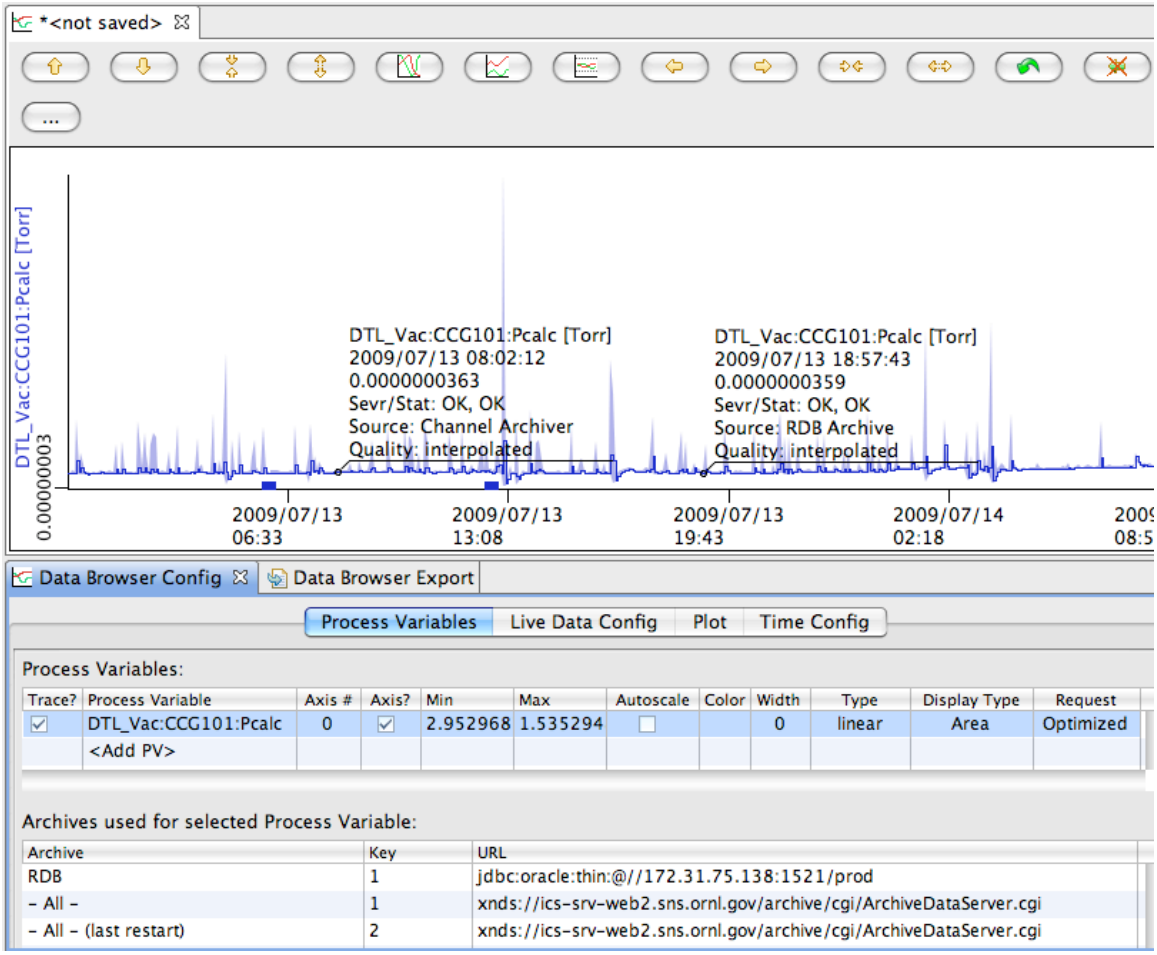


Figure 3: Data was fetched from RDB as well as old data sources.

Searching for PV Names

If you don't know the PV name, or are not sure if it's in the archive, you can locate them in the *Data Browser Archives* search panel. As shown in Fig. 4, you start by selecting the data source URL. It should contain the "jdbc:oracle:…" URL for the new archive as well as the older "xnds:…" data sources.

In the old system, selecting a URL was typically followed by selecting one or more of the 80+ sub archives, for example "RCCS/Vac" when looking for vacuum related PVs. In the RDB system, there is only a single "rdb" sub-archive for all the PVs.

Enter the name search pattern, press "Search". The pattern format is briefly explained in a tool-tip (hover the mouse over the pattern text box) as well as the online help (Menu Help, Help Contents, section CSS Applications/Trends/Data Browser/Archive View).

When one or more PV names are found, you can select them and either

a) Right-click on the PV names, select CSS/Data Browser to create a new Plot with just the selected PVs.
b) Drag-and-drop the PV names into an existing plot, either the main plot area or one of the vertical value axes of the plot.

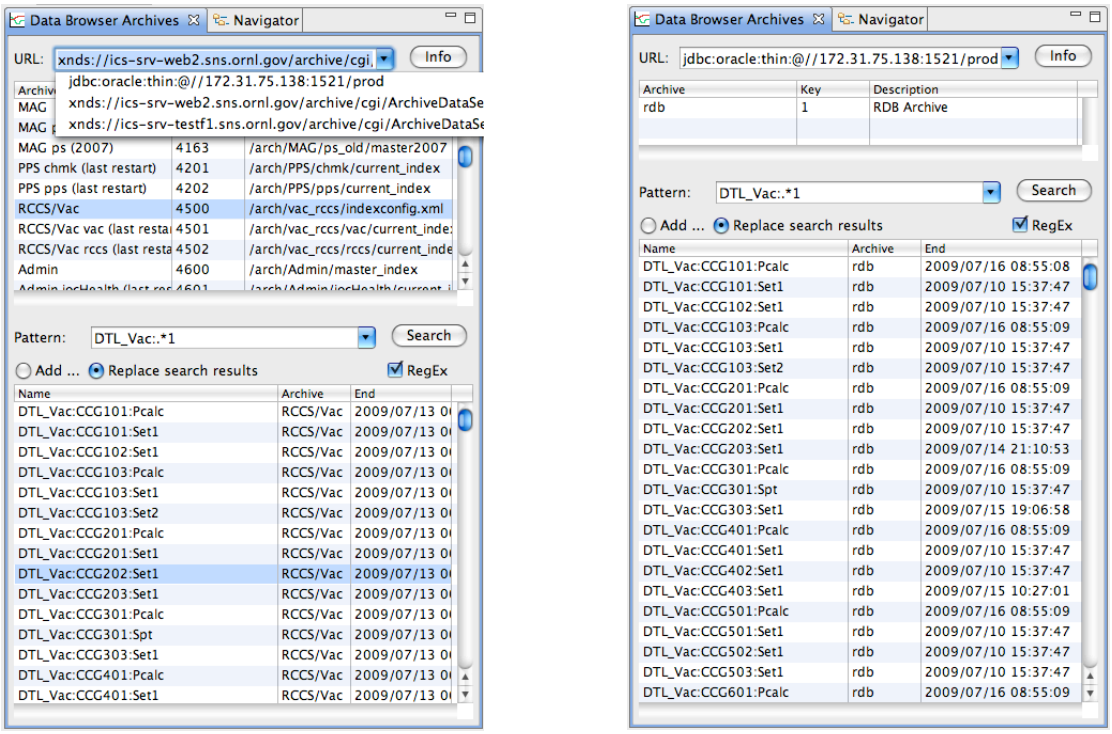
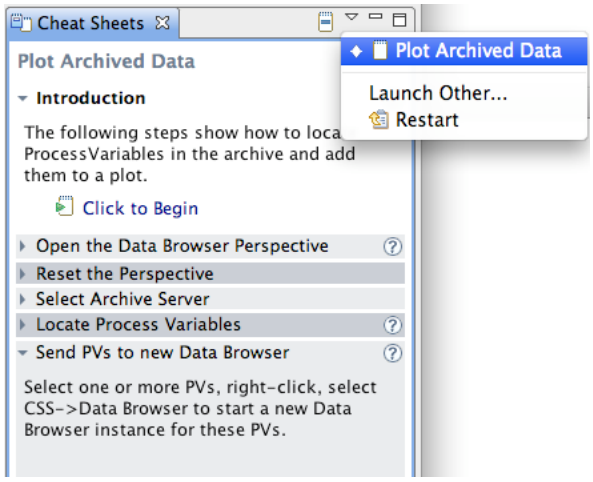


Figure 4: Searching for PVs in *Data Browser Archives* panel, using the old "xnds:…" URLs compared to the new "jdbc:oracle:…" URL.

Cheat Sheet

The whole process of searching for PVs and adding them to a plot is also described in an online cheat sheet with step-by-step instructions.

Figure 5: Menu *Help/Cheat Sheets…* will open the *Cheat Sheets* Panel. Press the small white triangle in the upper right border, select the *Plot Archived Data* topic, and follow along.



Comparison to old 'archiveviewer'

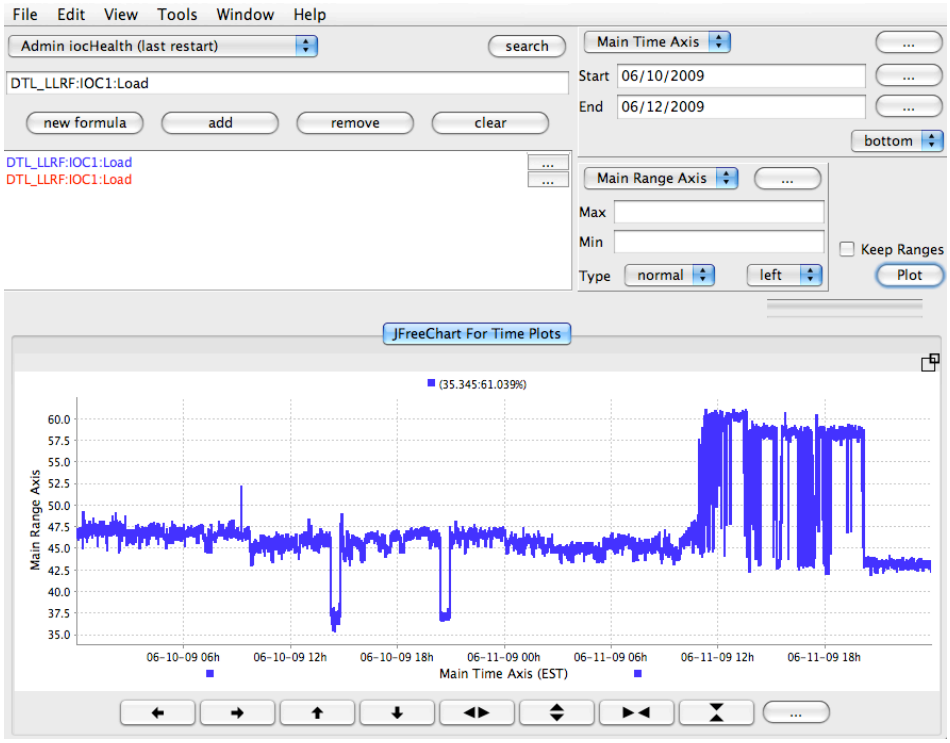


Figure 6: Old archive viewer.

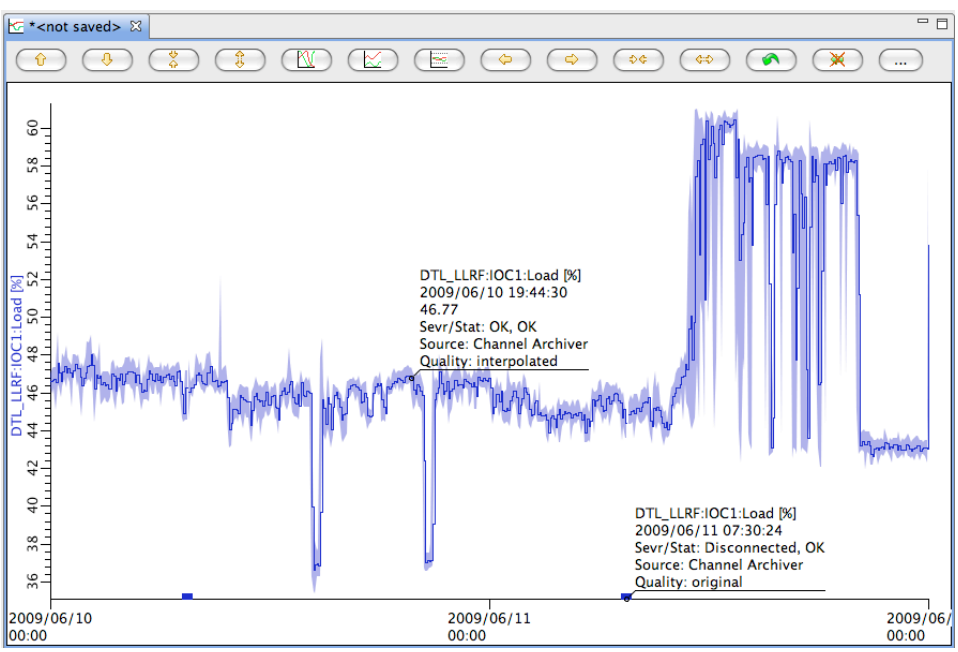


Figure 7: Same data as Fig. 6 in CSS Data Browser.

Figs. 6 and 7 show the same PV over the same time range. Since the archive viewer can only display samples from the 'old' archive, a time before 7/13 was chosen, so both in fact display the exact same data.

Notes and comments:

- In the archiveviewer, you typically needed to add each PV twice; first from a "last restart" sub-archive, then from a more general sub-archive. Now, just entering the PV name will often be sufficient because the Data Browser by default searches the RDB, the old 'All' as well as 'All – last restart' sub-archives for data. PV name searches can be restricted to the single 'rdb' sub-archive.
- The Data Browser plot itself shows the PV names, units, allows addition of markers. The archive viewer plot itself does not tell you what PV for example the blue line might represent.
- The Data Browser also acts as a Strip Tool for live data, not only archived samples.
- You can right-click on the Data Browser plot to save a snapshot image file or to send the commented plot to the E-Log, while the archive viewer required a separate screenshot program.
- Especially when looking at more than one day of data, displaying each raw sample is typically impossible because your computer would run out of memory. Both tools consequently obtain a reduced data set.
  The archive viewer requested 800 min/max samples and displayed them as a 'fat' line.
  The Data Browser requests 500 min/max/average samples, displaying the average with a line, the min/max with a shaded are around the average. You can configure the '500' (Menu CSS/Preferences/…). You can select to only show the average without the min/max (*Display Type* in Config. Panel).
  Both tools would automatically show the 'raw' data once you zoom in far enough that there is no reason to reduce the data, but the Data Browser allows you to force "Raw" data requests if you so desire (*Request Type* in Config. Panel, use at peril of running out of memory).

Web Reports

The menu *CSS/Web/Web Reports* leads to a web page with *Archive Configuration* reports, which in turn allows inspection of the detailed sample engine configuration of the RDB archive system.

Figure 8:
Web report for sample engine configuration of a channel.

Archive Channel

Channel	
Channel Name	DTL_LLRF:IOC1:Load
Channel Description	
Channel ID	11740
Sample Mode	Scan
Sample Period [hh:mm:ss]	00:00:10
Sample Count in last 01:00:00 h	119
Samples/sec in last 01:00:00 h	0.033
Engine Name	iocs
Engine URL	http://ics-srv-softioc4:4501/main
Group Name	iocHealth
Group Description	
Group Retention	Forever

(Show last 1.0 hours)

Recent Samples

Time	Value	Severity	Status
2009-07-16 11:09:47.120068666	37.5	OK	OK
2009-07-16 11:09:27.118950666	37.36951983298539	OK	OK
2009-07-16 11:09:07.116707666	37.5	OK	OK
2009-07-16 11:08:47.115851666	37.36951983298539	OK	OK
2009-07-16 11:08:27.115303666	37.5	OK	OK
2009-07-16 11:08:07.117118666	37.62993762993763	OK	OK
2009-07-16 11:07:47.119542666	37.36951983298539	OK	OK
2009-07-16 11:07:27.120683666	37.5	OK	OK
2009-07-16 11:07:07.121806666	38.65030674846626	OK	OK
2009-07-16 11:06:47.123924666	37.36951983298539	OK	OK

Show last 10 Samples