



Applications

Kay Kasemir
ORNL/SNS

**Using Information and pictures from
Matthias Clausen, Jan Hatje, and Helge Rickens (DESY)**

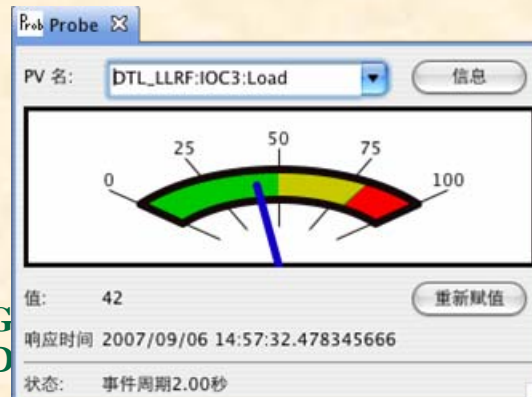
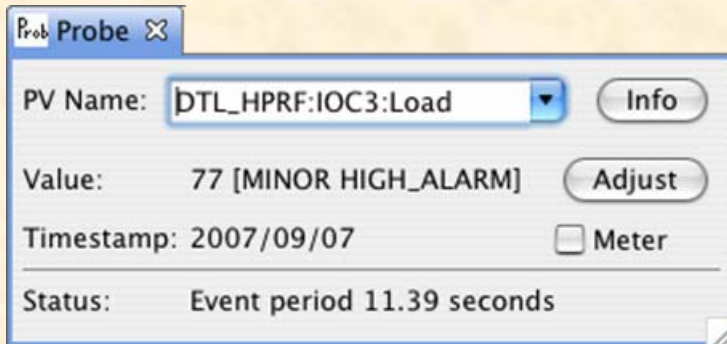
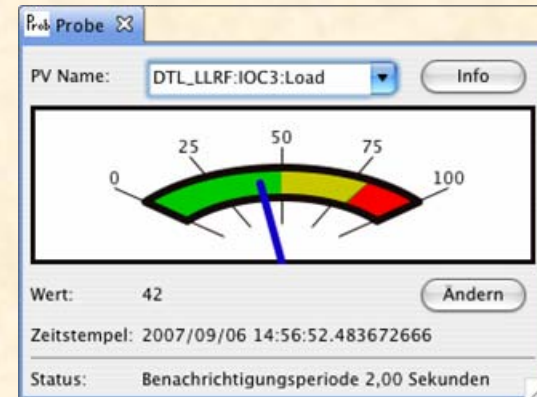
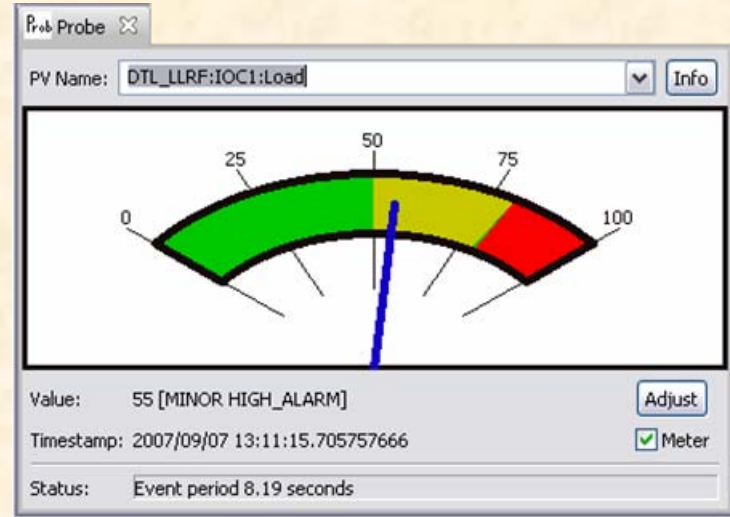
October 2007

Control System Studio

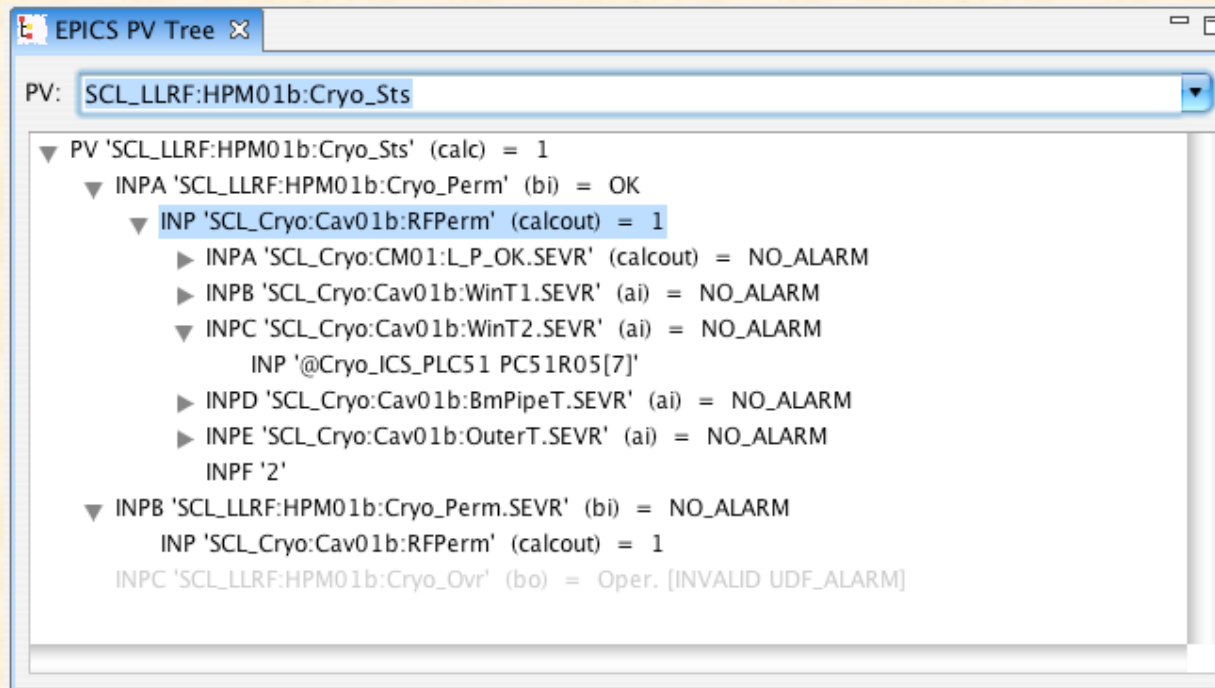
- **Goal: New control system (GUI) tools.**
 - Consistent Look and Feel
 - Data exchange beyond copy/paste of PV names
 - Run on Windows, Linux, Mac OS X, ...
 - Interface to more than one control system
- **Approach:**
 - Build on the Eclipse (Java) framework
 - Add
 - Data types and APIs for Front-End Computer (FEC), Process Variable (PV), Live and archived data samples
 - Guidelines for integration into menu, online help, preferences, ...
 - *See Software Technology talk: "Control System Studio", Jan Hatje (DESY)*

Simple 'Probe' Example

- **Basic function**
 - Enter PV name, see values.
- **CSS Version**
 - Portable: Win32, Linux, OS-X
 - Localized
 - Window resizes
 - Drop-down list of recently entered PV names



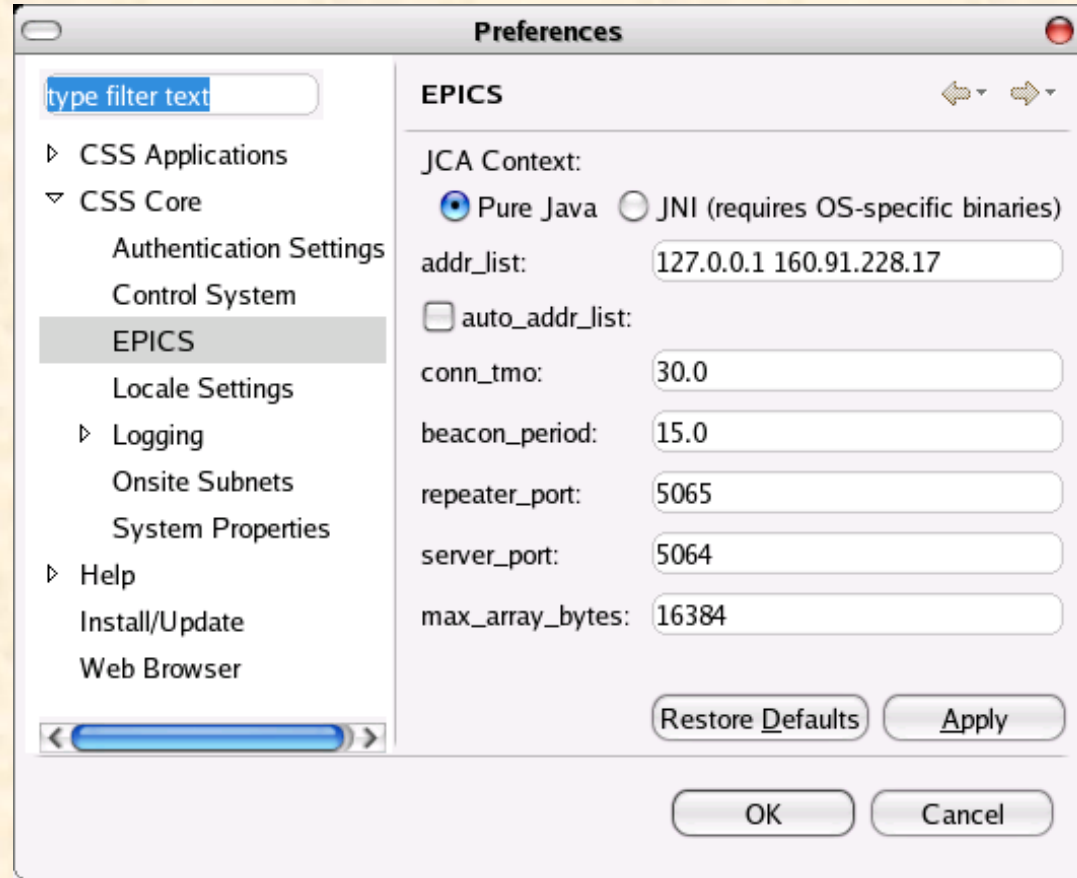
EPICS 'PV Tree'



- **CSS Application plugin for Eclipse that displays EPICS record data flow**
 - Inputs of 'calc' record etc.
 - Recursively descending

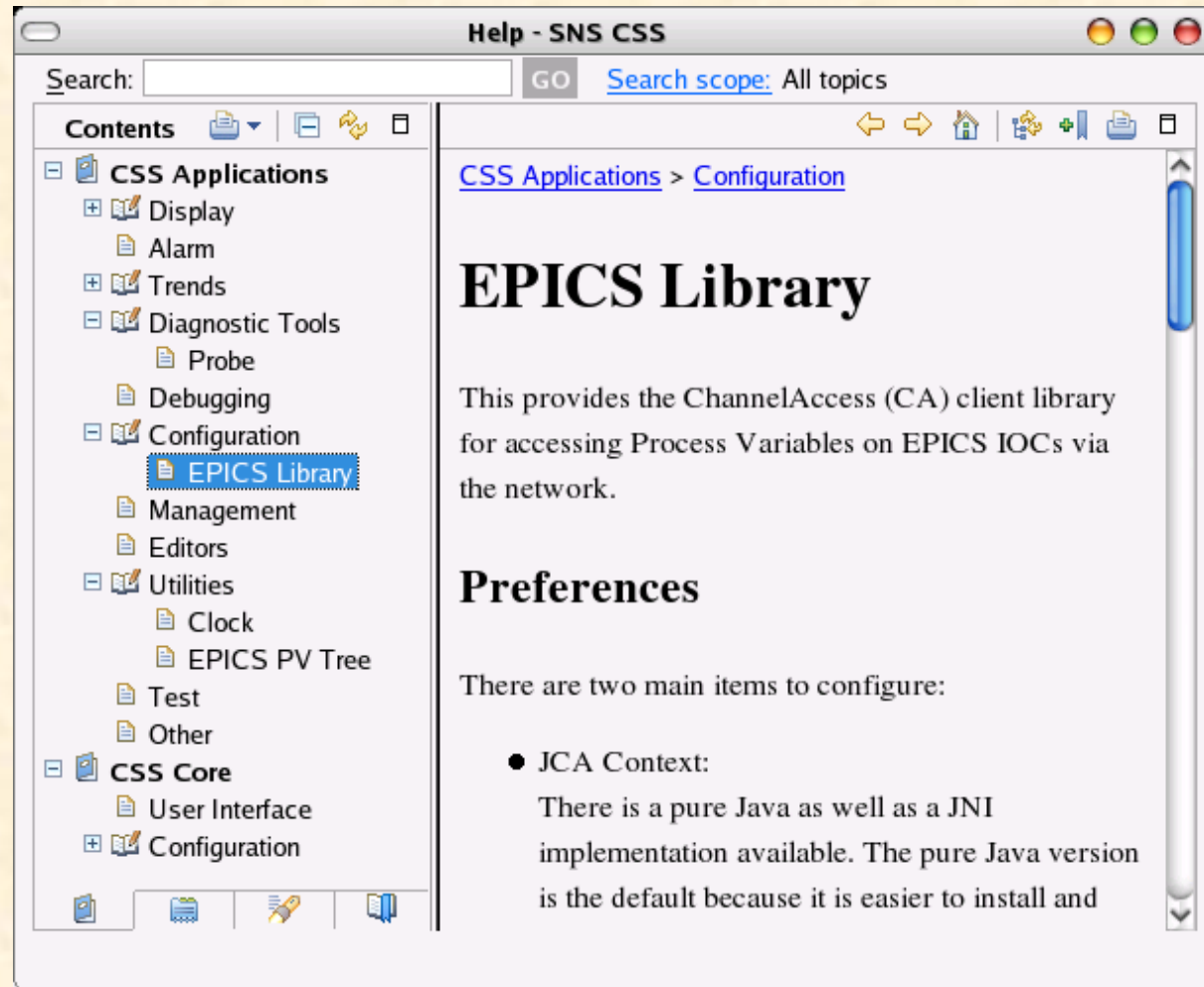
Common Preferences

- **CSS apps use the Eclipse preference system**
 - Not just for apps! Also for libs like EPICS Channel Access support
 - No environment variables, nor special setup files for each application
 - GUI



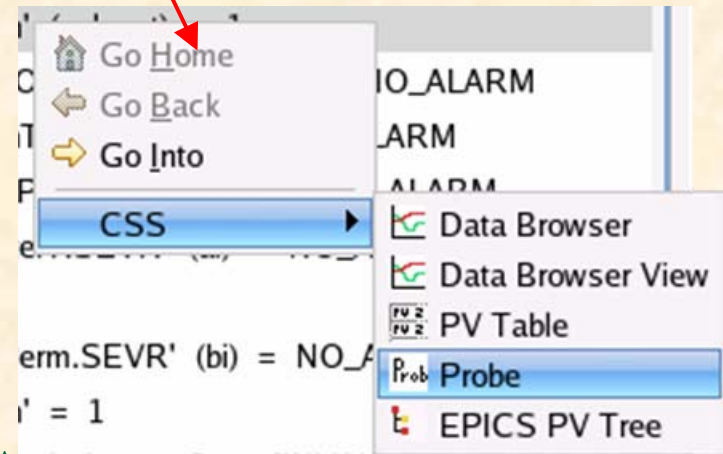
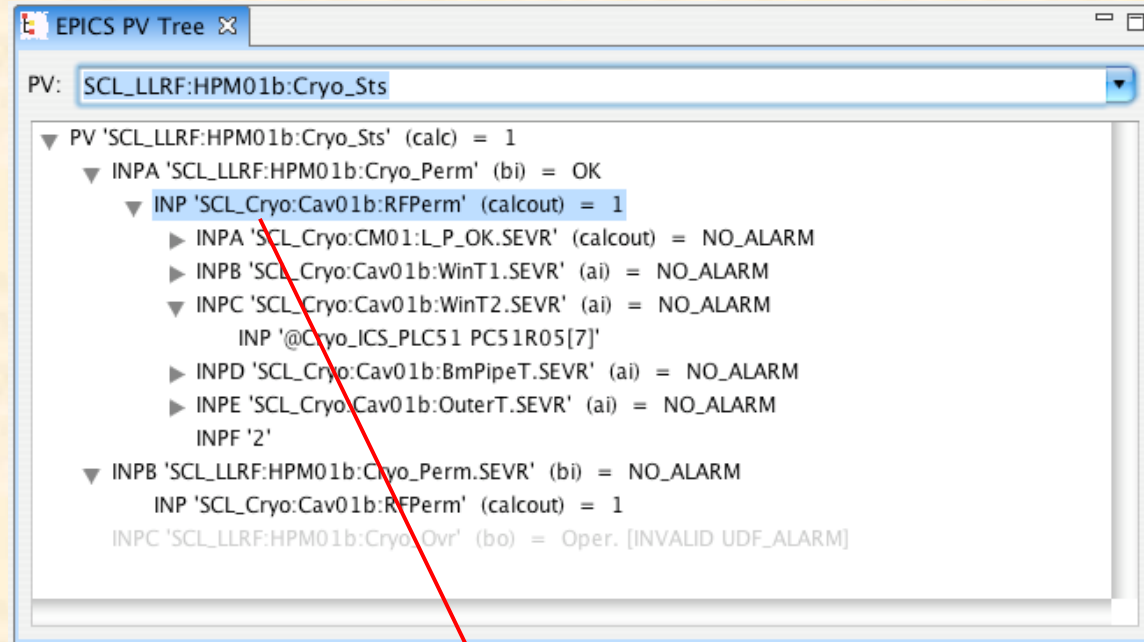
Common Online Help

- Applications
- Support Libraries
- ... from different
 - authors,
 - sites



CSS Context Menus

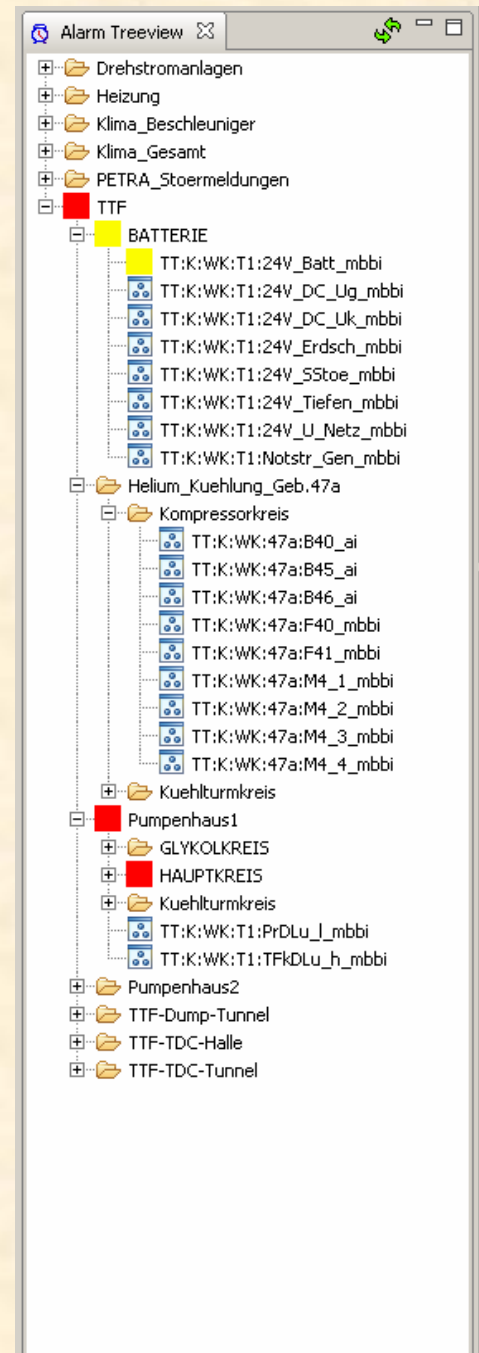
- **Send "PV" to other application that handles PVs**
 - or FEC, Data, ...
- **Based on Eclipse "Object Contributions"**
 - No compilation, no configuration when adding new application



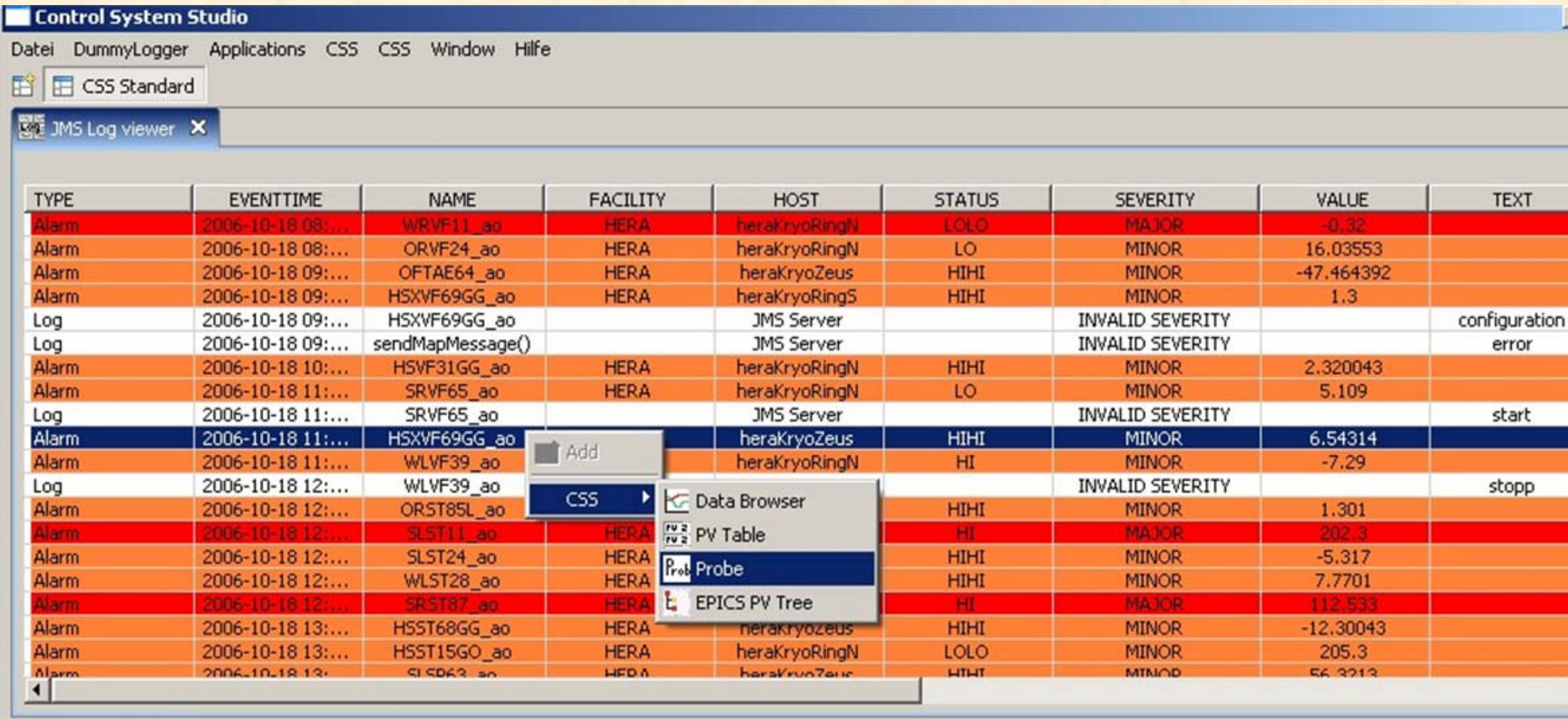
DESY Namespace Browser, Alarm Tree



- **CSS Applications that browse DESY LDAP server**



DESY Message Log Viewer



The screenshot shows the 'Control System Studio' interface with a 'JMS Log viewer' window. The window displays a table of messages with columns: TYPE, EVENTTIME, NAME, FACILITY, HOST, STATUS, SEVERITY, VALUE, and TEXT. The messages include various alarms and logs from 2006-10-18. A context menu is open over the table, showing options: Add, CSS (with a submenu), Data Browser, PV Table, Probe, and EPICS PV Tree.

TYPE	EVENTTIME	NAME	FACILITY	HOST	STATUS	SEVERITY	VALUE	TEXT
Alarm	2006-10-18 08:...	WRVF11_ao	HERA	heraKryoRingN	LOLO	MAJOR	-0.32	
Alarm	2006-10-18 08:...	ORVF24_ao	HERA	heraKryoRingN	LO	MINOR	16.03553	
Alarm	2006-10-18 09:...	OFTAE64_ao	HERA	heraKryoZeus	HIHI	MINOR	-47.464392	
Alarm	2006-10-18 09:...	HSXVF69GG_ao	HERA	heraKryoRingS	HIHI	MINOR	1.3	
Log	2006-10-18 09:...	HSXVF69GG_ao		JMS Server		INVALID SEVERITY		configuration
Log	2006-10-18 09:...	sendMapMessage()		JMS Server		INVALID SEVERITY		error
Alarm	2006-10-18 10:...	HSVF31GG_ao	HERA	heraKryoRingN	HIHI	MINOR	2.320043	
Alarm	2006-10-18 11:...	SRVF65_ao	HERA	heraKryoRingN	LO	MINOR	5.109	
Log	2006-10-18 11:...	SRVF65_ao		JMS Server		INVALID SEVERITY		start
Alarm	2006-10-18 11:...	HSXVF69GG_ao		heraKryoZeus	HIHI	MINOR	6.54314	
Alarm	2006-10-18 11:...	WLVF39_ao		heraKryoRingN	HI	MINOR	-7.29	
Log	2006-10-18 12:...	WLVF39_ao				INVALID SEVERITY		stopp
Alarm	2006-10-18 12:...	ORST85L_ao			HIHI	MINOR	1.301	
Alarm	2006-10-18 12:...	SLST11_ao	HERA		HI	MAJOR	202.3	
Alarm	2006-10-18 12:...	SLST24_ao	HERA		HIHI	MINOR	-5.317	
Alarm	2006-10-18 12:...	WLST28_ao	HERA		HIHI	MINOR	7.7701	
Alarm	2006-10-18 12:...	SRST87_ao	HERA		HI	MAJOR	112.533	
Alarm	2006-10-18 13:...	HS5T68GG_ao	HERA	heraKryoZeus	HIHI	MINOR	-12.30043	
Alarm	2006-10-18 13:...	HS5T15GO_ao	HERA	heraKryoRingN	LOLO	MINOR	205.3	
Alarm	2006-10-18 13:...	SLSP63_ao	HERA	heraKryoZeus	HIHI	MINOR	56.3213	

- Alarm System development would fill another talk.
- Point: CSS Integrates generic, CS- and site-specific tools

Data Browser

URL: <xnds://ics-srv-web2.sns.ornl.gov> Info

Archive	Key	Description
Target	4800	/arch/TGT/master_ind
Target Loops (last r	4801	/arch/TGT/loops/curre
ModeratorColdbox	4802	/arch/TGT/mcb/curre
Target shut (last re	4803	/arch/TGT/shut/curre
RF	4900	/arch/RF/master_inde
RF llrf (last restart)	4901	/arch/RF/llrf/current_i
RF hprf (last restart	4902	/arch/RF/hprf/current
RF refine (last resta	4903	/arch/RF/refline/curre
RF xstart	4950	/arch/RF_xstart/maste
RFQ xmtr1 start (la	4951	/arch/RF_xstart/rfq1_

Pattern: Search

Add ... Replace search results RegEx

Name	Archive	Start
SCL_LLRF:FCM01a:AutoSetRotOffse	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:CtIDDS	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:CtIRFPW	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:FdFwd_mag	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:FdFwd_phase	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:FdFwd_type	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:Gain	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:Gain_Rot	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:Int_scale	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:RfRef_AmpMea	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:T_FB	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:T_FdFwd	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:cavAmpAvg	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:cavAmpSet	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:cavPhaseAvg	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:cavPhaseSet	RF llrf (l	2007/09/
SCL_LLRF:FCM01a:cavV	RF llrf (l	2007/09/
SCL_LLRF:Gate01a_LOCAL:EventSe	RF llrf (l	2007/09/
SCL_LLRF:Gate01a_LOCAL:Phase	RF llrf (l	2007/09/
SCL_LLRF:HPM01a:ADC0_Loss	RF llrf (l	2007/09/
SCL_LLRF:HPM01a:ADC1_Loss	RF llrf (l	2007/09/
SCL_LLRF:HPM01a:ADC2_Loss	RF llrf (l	2007/09/
SCL_LLRF:HPM01a:ADC3_Loss	RF llrf (l	2007/09/
SCL_LLRF:HPM01a:ADC4_Loss	RF llrf (l	2007/09/
SCL_LLRF:HPM01a:ADC5_Loss	RF llrf (l	2007/09/
SCL_LLRF:HPM01a:ADC6_Loss	RF llrf (l	2007/09/

refline.css-plt

Data Browser Config

Process Variables | Live Data Config | Time Config

Process Variables:

Visible	Process Variable	Axis	Min	Max	Autoscale	Color	Width	Type	Disp...Type	Request
<input checked="" type="checkbox"/>	DTL_LLRF:FCM1:RfRef_AmpMeas	0	14525.304	15506.983	<input type="checkbox"/>	 	0	linear	Lines	Optimized
<input checked="" type="checkbox"/>	SCL_LLRF:FCM01a:RfRef_AmpMeas	1	18556.521	19687.282	<input type="checkbox"/>	 	0	linear	Lines	Optimized

<Add PV>

Archives used for selected Process Variable:

Archive	Key	URL
- All -	1	xnds://ics-srv-web2.sns.ornl.gov/archive/cgi/ArchiveDataServer.cgi
- All - (last restart)	2	xnds://ics-srv-web2.sns.ornl.gov/archive/cgi/ArchiveDataServer.cgi

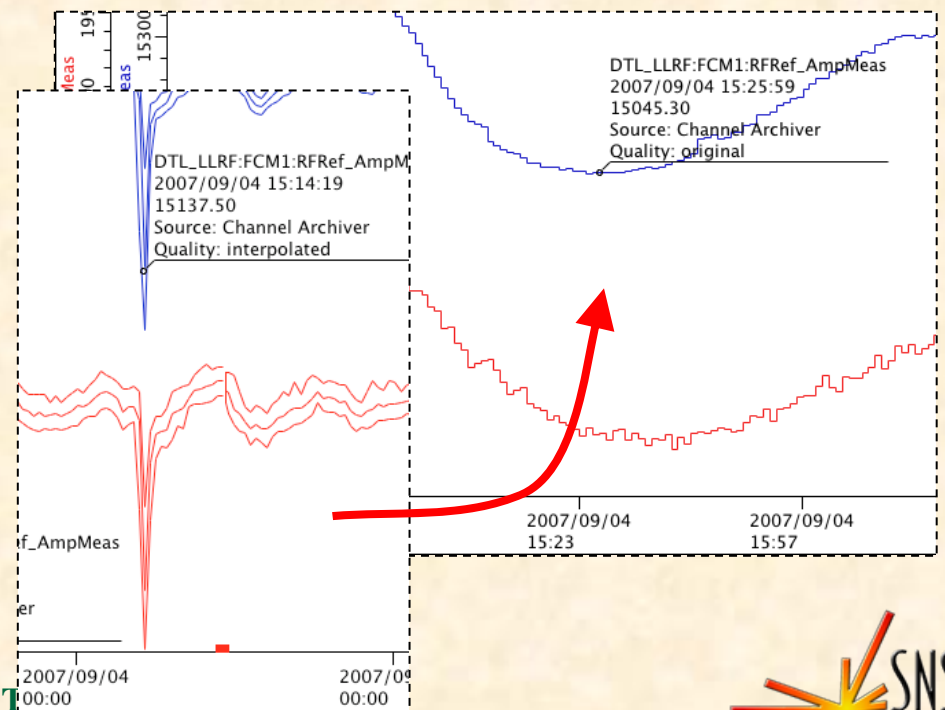
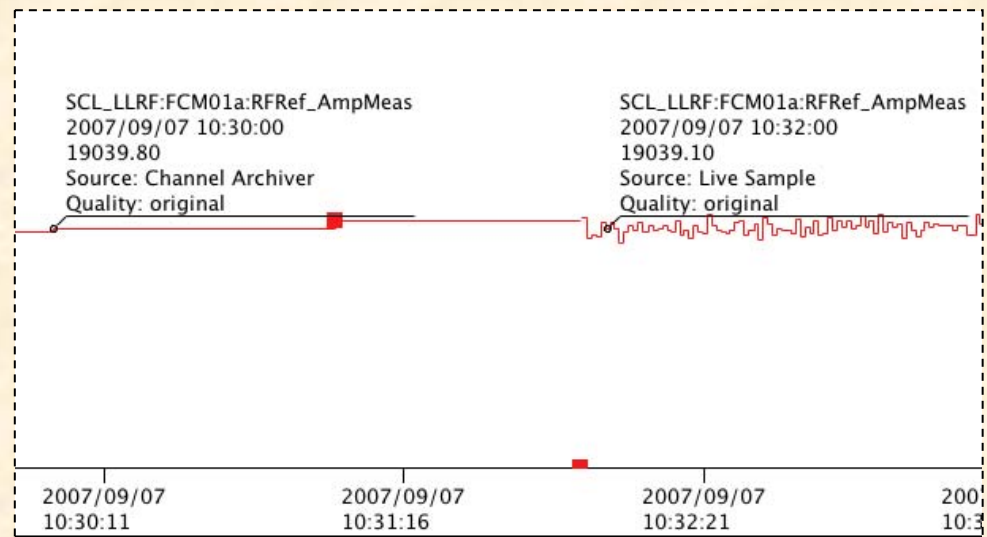
CSS Samples

- **Markers indicate source**

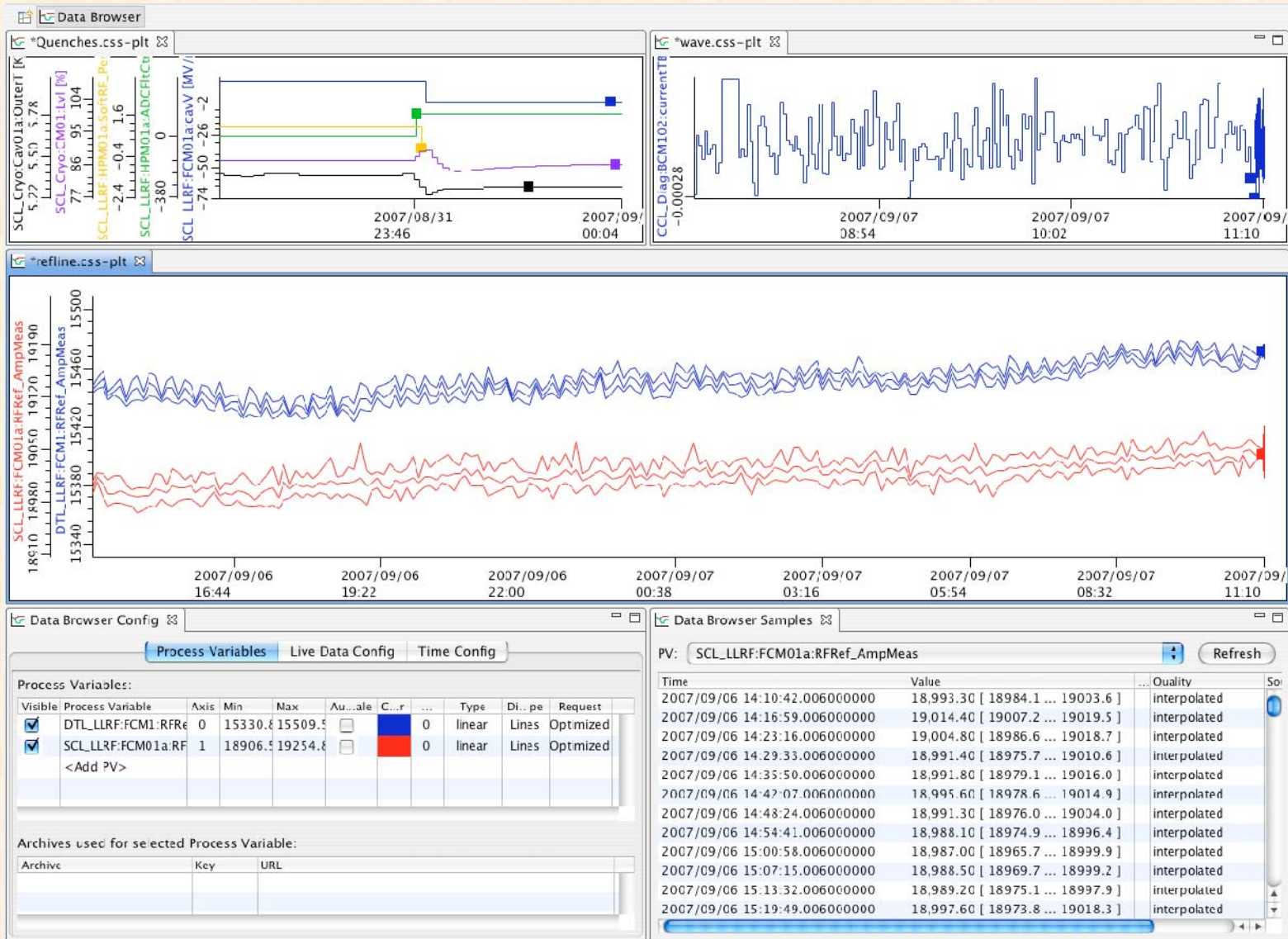
- Live Sample?
- Channel Archiver?
- Archive Record?

- **Samples have 'quality'**

- Original sample
- Interpolated Sample
- Ideally, data server automatically switches from interpolated to original when zoomed in "far enough"

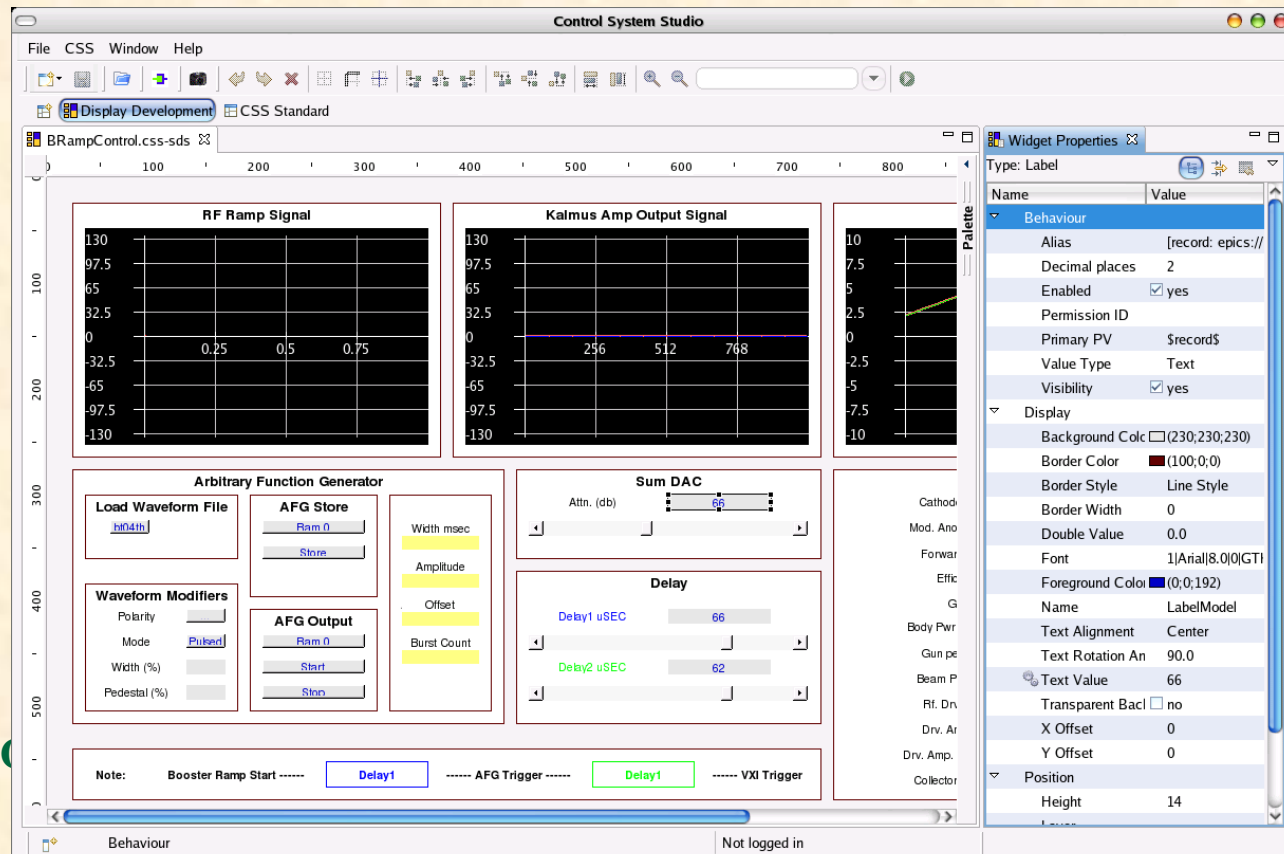


Multiple Data Browser Instances

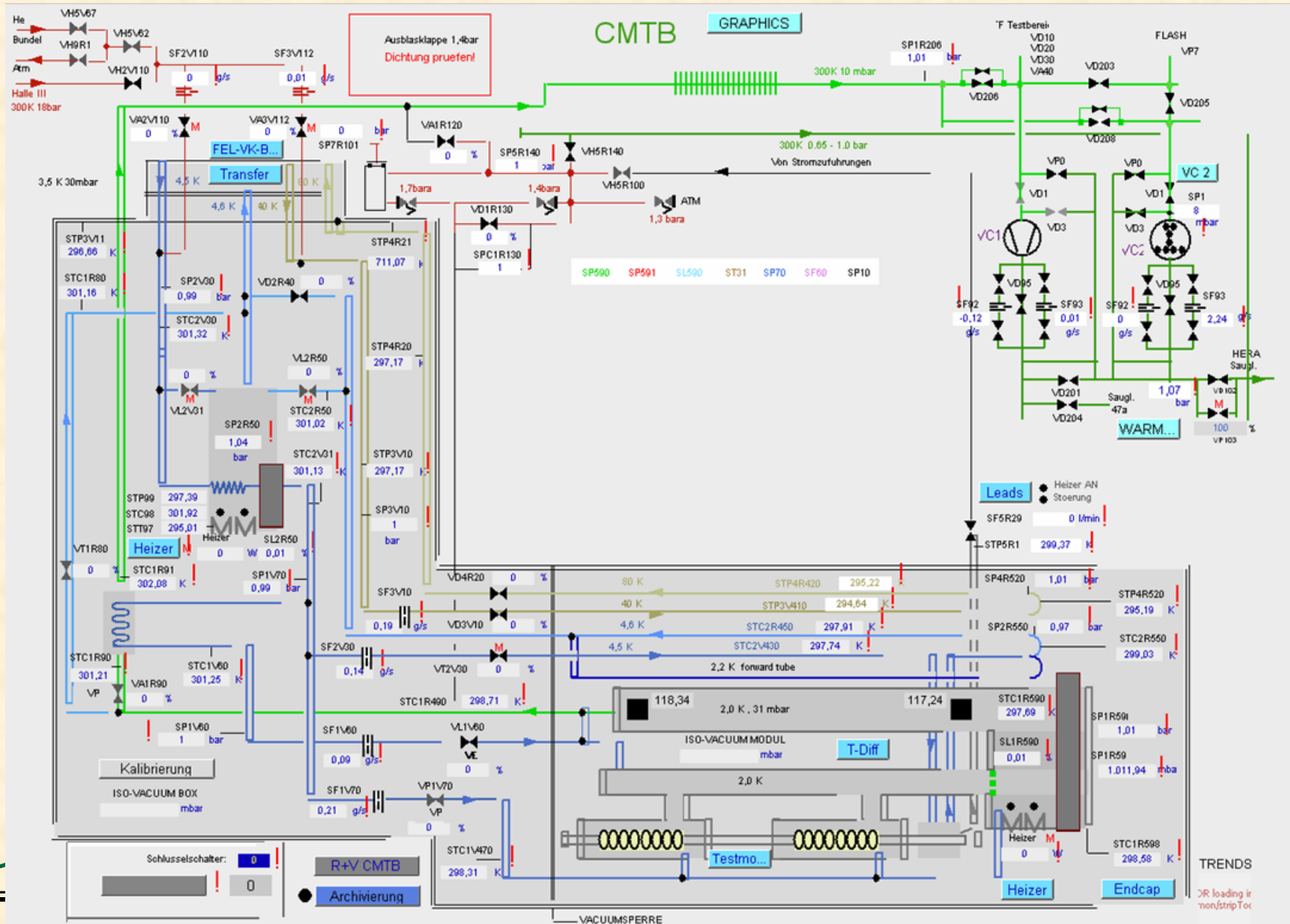


Synoptic Display

- Operator interface tool for multiple protocols
- Promising ideas
 - Everything is dynamic
 - "Text Update" widget = Label with dynamic text

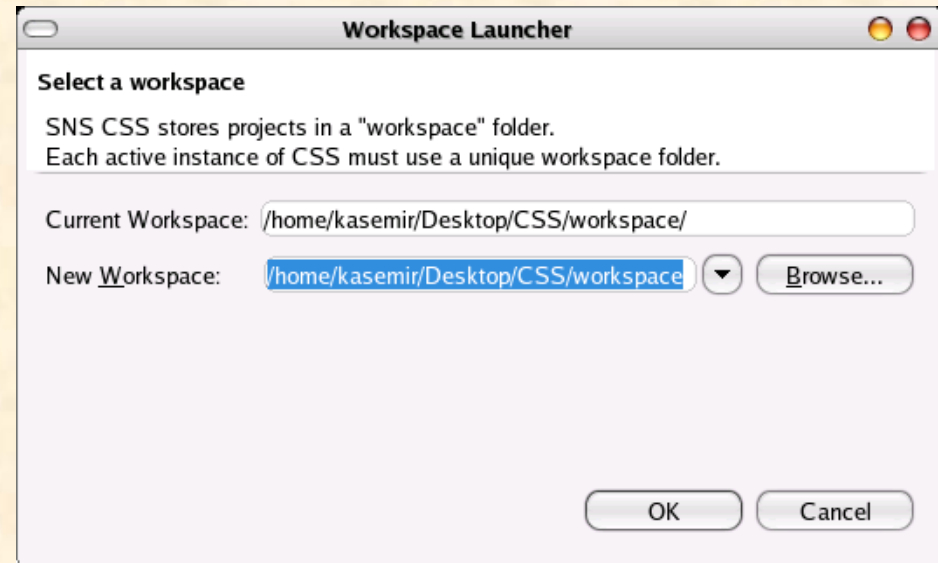
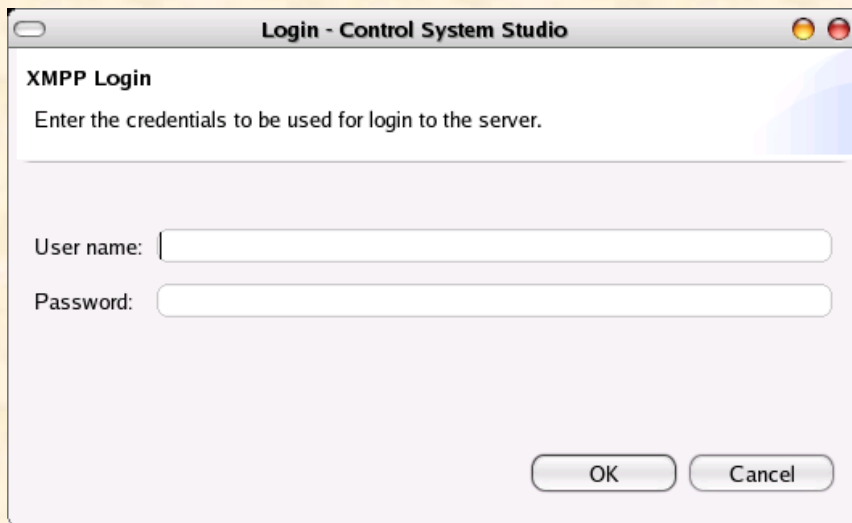


Synoptic Display Example



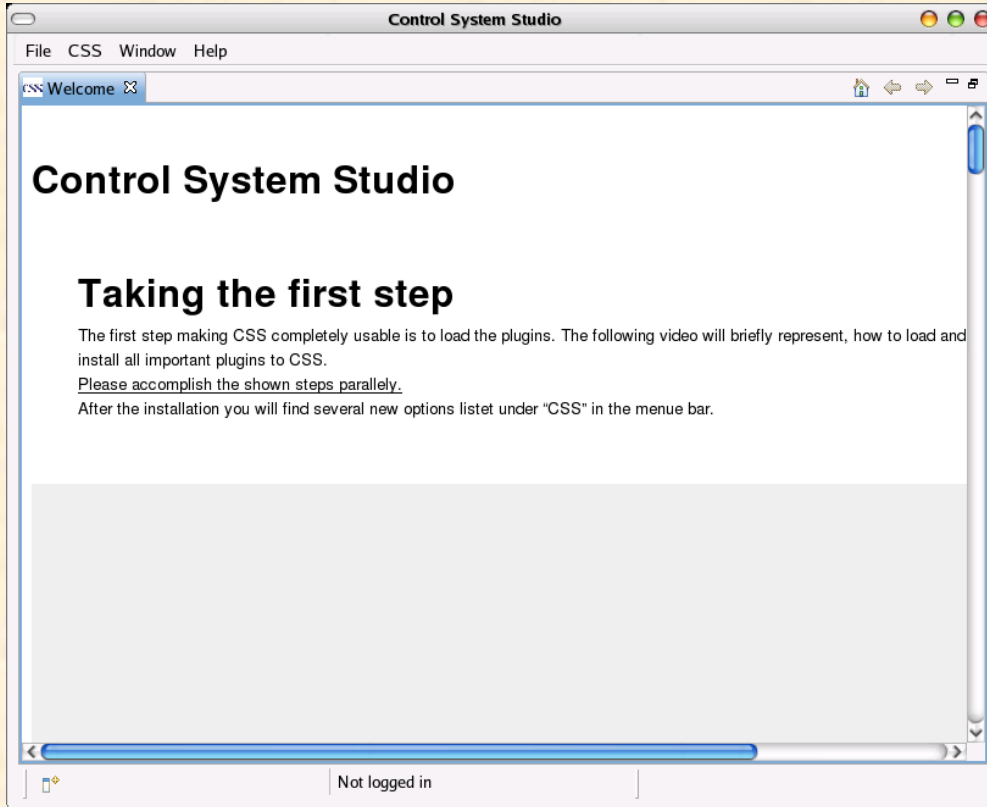
CSS Startup Choices

- **Startup with login/password for your XMPP server**
- **.. or workspace selector**



- **.. or other site-specific authentication**

Customizable Welcome Screen



- Different sites can customize depending on local needs.



Conclusion

- **Eclipse offers a modern, portable application framework**
- **CSS adds control-system specific APIs and guidelines**
- **There are already several useful general-purpose CSS applications**
- **You can add site-specific CSS applications**
- **All can be packaged as needed, everything is integrated; common look, behavior, data exchange, ...**

